IDENTITY STRUCTURE AND AUTOBIOGRAPHICAL MEMORY: A CONSTRUCTIVIST PERSPECTIVE

BY

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The current study tests the relationship between identity development and autobiographical memory recall. The position is advanced that subjects' identity style should influence both the recall of personal memories and the impact of that recall on self-perceptions. Following Berzonsky's paradigm, a mixed-sex sample of 202 people falling into one of three identity styles (information-oriented, normatively oriented, and diffusely oriented) were identified for the study at pretesting. Subjects subsequently completed a computer-interactive memory paradigm that manipulated the recall of memories using memory cues that varied valence (positive characteristics or negative characteristics)

and self-consistency (self-congruent or self-incongruent with current self-perceptions).

As predicted, information-oriented individuals generated the greatest number of autobiographical recollections and diffusely oriented subjects generated the fewest. Recall was also found to vary across conditions, with information-oriented individuals showing the highest recollection among the three identity styles for memories that supported positive self-perceptions, as well as the greatest ability to generate memories that threatened those self-perceptions. A general self-enhancement effect was also evident, particularly among information and normative-oriented individuals, the latter being the most inclined of the three identity styles to generate invalidating memories when it benefited them (positive/incongruent) and the least inclined when it threatened them (negative/invalidation).

CHAPTER I
REVIEW OF THE LITERATURE

Many years ago an unmanageable adolescent by the name of Samuel Clemens took leave of what he described as his "stupid, know-nothin" father. Several years later, when the famous American humorist had returned home as a young adult after weathering the world on his own for awhile, Mark Twain was "astonished to find out how much the old man had learned in those few years."

Autobiographical memories such as this are not only amusing testaments to predictable developmental milestones, but also serve as subtle reminders that autobiographical memories are based on our own personal development. Even as we forge notions of our "selves," we shape and frame the nature of our later recollections. Our identities and memories are "two sides of the same coin" (Greenwald & Banaji, 1989).

This study will address the constructive and reconstructive aspects of autobiographical memory broadly, placing particular emphasis on the interdependence between memory recall and the continuously evolving self. It provides a way of looking at the role of cognitive schemas in interpreting and deriving meaning from experience, which enables the

assimilation of perceptual information as memories. This helps explain the effects of self-perceptions on the recall of memories about the self, as well as the effects of personal memories on self-perception.

Common Theoretical Orientation

The current study will provide a theoretical crossroads among three distinct areas of psychology. A constructivist approach to each of these areas is used to provide a common conceptual link. A generic view of constructivist assumptions follows in order to help orient the reader to the theoretical underpinnings of the current study.

Personality theorists (Kelly, 1955; Kihlstrom, 1981; Markus, 1977), memory theorists (Barclay 1986; Bartlett, 1932; Neisser, 1967, 1976), and developmental theorists (Berzonsky, 1990; Piaget & Inhelder, 1973) have long recognized the importance of understanding the processes and structures that govern the organization of an individual's psychological world. These constructivist theorists have advanced similar notions of knowledge structures, referred to generically as schemata, to describe the active organizational processing of information. Schemata are nonspecific representations of prior experiences that are elaborated upon during every moment of ongoing mental activity and are used to guide the comprehender's interpretations, inferences,

expectations, and attention (Neisser, 1967). Schemata are used continuously to impose order and meaning upon the world in a subjective manner. Schemata are hierarchically organized into a network of idiographic meaning that continuously changes with experience (Barclay, 1986; Kelly, 1955; Neisser, 1988a). Schemata form implicit theories that both guide and limit an individual's growth (Berzonsky, 1990; Ross & Conway, 1986; Ross & McFarland, 1988). This study will show how these three converging areas of psychology can help to illuminate the relationships between the processes of identity development and the processes of autobiographical memory recall. The interrelationships among these three areas will be examined in detail, and the possible implications for counseling explored.

Autobiographical Memory

Memory research has for many years been more concerned with the accuracy of memories as tested under laboratory conditions than what the memories might say about the person. However, there is a new trend in memory research toward investigating "real-world" memory. Of particular interest to this study is an emerging interest in autobiographical memory (Brewer, 1988; Linton, 1975, 1978, 1988; Robinson, 1976, 1988). Robinson defines autobiographical memory as "memories a person has of his or her own life experiences" (1988, p.

19). What a person can and cannot remember could reveal a great deal about that person's personality development.

Common assumptions about the nature of autobiographical memory have been advanced by several theorists and researchers in this area (Barclay, 1986, 1988a; Brewer, 1988; Linton, 1988; Neisser, 1981, 1988a, 1988b). The first assumption is that autobiographical memory is largely a reconstructive endeavor based on supporting existing self-schemata, often at the expense of the facts. As Barclay has put it, these memories "are true but inaccurate" (1988b, p. 289). This implies that these self-structures both maintain and transform our personal memories. A second assumption is that these self-schemata are hierarchically organized. Therefore, autobiographical memories are remembered based on cues from this nested structure. Finally, the distinction between episodic and semantic memory does not always accurately describe the nature of autobiographical memories. An autobiographical memory is often a constructed amalgam of repeated episodic memories. Thus it is often an episode that symbolically represents something else. For example, if a person were to remember "being together with my family at the beach to celebrate Memorial day last year," the recollection of the event might be as if all of the members of that person's family were present, even if in fact one member

had been absent. Such a memory might carry the more symbolic meaning of family unity.

Sir Francis Galton, a contemporary of Ebbinghaus, was the first to begin research on autobiographical memory. In his 1883 informal experiment, Galton used words as memory prompts for himself and "allowed a couple of ideas to successively present themselves" (1883, p. 426). He recorded the reaction time for each response. Later, he grouped his recollections according to periods in his life and the type of memory the word evoked. Galton's technique was successful in producing an open-ended sampling of his thoughts in general, but was not specific enough to evoke just personal memories. Due to Galton's varied interests he failed to pursue this line of research (Brewer, 1988; Crovitz & Schiffman, 1974; Robinson, 1988).

The Ebbinghaus tradition of studying the accuracy of memory continued to reign for the next ninety years largely unchallenged. However in 1932, Bartlett questioned whether there were other factors besides accuracy in memory that would be of interest to researchers. He examined subjects' recall of narrative prose passages and observed that they had omitted, transformed, reorganized, and otherwise distorted the information contained in the original source (Bartlett, 1932). Bartlett concluded "Remembering appears to be far more decisively an affair of reconstruction than mere

reproduction" (p. 205). Bartlett believed that memories of the past were "continually remade" based on the individual's present self-structure (p. 309). Thus, Bartlett began the constructivist approach to memory functioning. This approach emphasized the use of schemata as organizing principles that at times enable or disable the retrieval of personal memories. In this view, autobiographical memories are "selected" to fit the individual's current self-theory and help the individual maintain a consistent sense of self in the face of change. Unfortunately, Bartlett's insights went largely unnoticed until the mid-1970s.

However, by the mid-1970s a gradual shift in the notions of what types of things people remember had occurred (Neisser, 1988b). Tulving's (1972) introduction of the distinction between long term "semantic" memory and single event "episodic" memory generated interest in whole new areas for study within memory research. Bartlett's constructivist theory of memory enjoyed a new popularity. Therefore when Crovitz and Schiffman (1974) revived Galton's prompting technique by modifying it to study autobiographical memory, many researchers were eager to begin lines of research in autobiographical memory (Robinson, 1988). In their landmark paper, Crovitz and Schiffman directed subjects to "note down a word or two describing the memory associated with each word" (1974, p. 517) and then had subjects date their

memories. In the following two years these directions were modified in order to elicit more specific memories (Crovitz & Quina-Holland 1976, p. 61) and more personally meaningful memories (Robinson, 1976, p. 581). The real-life research studies that have used Crovitz's technique constitute the most sophisticated long term memory research to date. The research clearly demonstrates that the real-life memory retrieval process can be examined in a systematic manner within the experimental laboratory (Neisser, 1985). This paradigm holds much promise for the systematic investigation of autobiographical memory recall.

Much of the work from social psychology regarding individuals' self-schemata has demonstrated the central role of self-schemata in the recall of personal memories. In a series of studies, Markus (1977, 1980) has shown that individuals who were schematic for independence or dependence processed information more quickly and recalled more specific events from their past than did aschematic individuals. Furthermore, Markus and Sentis (1980) have found that information consistent with one's self-concept is remembered more accurately than inconsistent information. These studies and others (Barclay, 1988b; Barclay & Subramaniam, 1987) support the notion that self-schemata have a tremendous influence in enabling individuals to recall personal memories. From the results of these experiments one would expect that

individuals with more clearly defined self-schemata would be able to recall a greater number of personal memories and do so more quickly. Additionally, the fact that information inconsistent with the self is remembered less accurately may point to possible biases in processing personal memories.

The work of Ross and his colleagues (Ross & Conway, 1986; Ross & McFarland, 1988) has begun to address systematic biases in personal memory recall. Ross believes that implicit theories of ourselves in the present guide our recollections of the past. In addition, we each have our own theory of how we might change and still maintain a consistent sense of self. Our reconstructions of the past are shaped by theories that dictate assumptions of either consistency or inconsistency with ourselves in the present. In order to support this theory of self-change we use biased processing to either exaggerate differences or similarities between our past and present selves when we remember. Thus, we are at times "cognitive conservatives who bias their memories so as to deny change and maintain consistency," and at other times "cognitive radicals who embrace change and exaggerate the amount they have altered." For example, a professor may remember himself before receiving tenure as having been a confident and energetic young man, rather than as the anxious and driven individual he actually was. Conversely, he may

now see himself as a devoted family man, even though he spends as much time working away from home as he ever did. Thus, these biases tend to confirm our existing self-theories.

Past research by Swann and Snyder demonstrated that an individual's hypothesis-testing about the self and others tends to be strongly confirmatory in nature (Snyder, 1984; Snyder & Swann, 1978; Swann, 1985). A series of experiments have shown that people prefer to confirm rather than to disconfirm their current self-images, even when those self-images are negative (Barclay & Subramaniam, 1987; Ross & Conway, 1986; Ross & McFarland, 1988). From the results of this research, then, we might expect that individuals who held a theory of self-consistency might tend to deny self-change in the face of disconfirming evidence. We might also expect individuals who lacked a unified theory of self-change to show relatively little tendency toward biased processing and instead drift in the direction of image discrepant recall.

Past work on identity formation has shown that different identity styles have characteristically different self-schemata structures (Neimeyer & Metzler, 1987). Because autobiographical recall varies with structural aspects of the self-schema, schematic differences among identity styles might carry important implications for memory recall (Barclay, 1988a).

Kihlstrom (1981) has called for research that examines how personal memory features are affected by personality development. "It is crucial to attempt some inquiry into the details of the underlying process" states Kihlstrom (1981, p. 141). It has been shown that autobiographical memories help structure and restrict a person's self-theory, so it seems likely that different stages in identity development might utilize this aspect of autobiographical information differently. Research in developmental psychology provides models of the processes underlying the formation of personal identity.

Identity Formation

Ever since Erikson's landmark work on life-span development (Erikson, 1959, 1968), psychologists have been interested in studying the developmental processes leading to the formation of a stable personal identity. Erikson identified eight stages of human psychosocial development, each of which was characterized by the need to resolve a specific conflict. He labelled the fifth stage, which occurs during adolescence, as the conflict between ego identity and identity diffusion. The adolescent must learn to cope with changes that challenge the sense of self developed in childhood. These changes include physical changes in appearance and abilities, a broader spectrum of emotional experience, and increasing social demands and expectations for more mature behavior

and the adoption of more adult roles. Successful resolution of this conflict should result in ego identity: a consistent sense of self that permits the adolescent to explore and select from among the alternatives for adulthood. Failure to resolve this conflict leads to identity diffusion; the adolescent is unable to make sense of all of the possibilities, and is left without a definite sense of self or a way to make positive life choices. As Berzonsky (1990) points out, ego identity as conceived by Erikson is not simply a static structure incorporating knowledge about the self, but is a process that "actively evaluates, selects, and organizes self-perceptions" (p. 3). This process is responsible for reality-testing and adaptation of constructions about the self, and may be the mechanism that enables an individual to successfully cope with change throughout later life.

Unfortunately, Erikson's formulation lacked a specific operational definition for key concepts, making it difficult to create a solid empirical foundation. However, Marcia's (1966) subsequent conceptualization of identity development extended Erikson's work and established a framework that permitted empirical investigation. Therefore, most research into identity formation over the past two decades has been based upon Marcia's paradigm.

Marcia's approach to the formation of ego identity is derived from two Eriksonian concepts: crisis and commitment. Crisis refers to the degree to which the adolescent is concerned with confronting and critically evaluating the issues relating to identity. Commitment describes whether the adolescent reaches a firm decision about what values and roles to adopt. Marcia identified four identity statuses that arise from differences along these two dimensions.

Identity achievement refers to the formation of an ego identity by reaching a state of commitment after having passed through a state of crisis. An achieved individual, therefore, is characterized as having taken a definite personal stand based upon decisions requiring reflection, questioning, and introspection.

In contrast, foreclosure refers to commitment that is attained in the absence of crisis. Foreclosed individuals have opted to accept an established set of values (such as their parents'), without confronting or questioning the issues involved. The child who unthinkingly pursues a career dictated by the parents' ambitions is a classic example of foreclosure.

Both achievement and foreclosure share the characteristic of high levels of commitment with respect to issues relevant to identity. These two statuses differ only in whether or not this commitment is produced as a result of a period of crisis. The actual stance

selected does not matter; the method by which the decision is reached is the crucial factor. For example, some achieved individuals may possess personal values very much in accord with their parents'. However, these adolescents have questioned and examined each of the values before incorporating them into their identities as personally suitable, and have not merely adopted their parents' views wholesale.

Moratorium individuals are engaged in an identity crisis, but have not yet been able to resolve it by committing to any particular set of values. They are actively seeking to find the answers to the questions of who they are and what they believe, and may appear preoccupied with identity concerns.

The fourth and final identity status is diffusion. Diffusion is characterized by a lack of commitment to a set of values and lack of an ongoing crisis state directed toward achieving commitment. Like moratorium individuals, diffuse individuals are indecisive on personal issues. However, unlike adolescents in moratorium, diffuse individuals are not actively concerned with establishing a sense of personal identity. They are not merely unable to arrive at a decision, for they do not perceive the need to make a final decision requiring the thoughtful investment of self. Diffuse individuals tend to see life choices, such as selection of an occupation, as temporary and easily reversible

concessions to the needs of the moment. They do not experience true crisis, because the impetus for decision-making is imposed from the outside rather than internally motivated. They similarly do not make true commitments, because they do not see their choices as having a definitional relationship to themselves.

In an effort to validate the theoretical distinctions among the identity statuses, Marcia conducted a series of studies with male college students (Marcia, 1966, 1967). Consonant with theoretical expectations based on their development of an internalized set of personal values, the identity achieving males were the most reflective, employed the most mature moral reasoning, and were the least submissive to authority of all the identity status groups. Moratorium males were found to resemble the identity achieving males in many respects, differing primarily by showing increased variability of responses and much higher levels of anxiety. Variability of response was most marked on learning performance under stress and maturity of moral reasoning measures. This variability was thought to be due to their lack of commitment to any particular set of moral values and uncertainty about the correctness of their judgments. The increased anxiety is consistent with the theoretical supposition that these individuals are in an active state of crisis. Foreclosed males, not surprisingly, adhered

to conventional norms of moral behavior, were submissive to authority, and exhibited low levels of anxiety. This supports the conjecture that these individuals have adopted established modes of thought and conduct and have thereby avoided crisis. The results from this set of studies regarding diffuse males, however, were not as conclusive. The measures used did not capture the distinguishing characteristics of this identity status, such as indecisiveness, very well, which led researchers to seek alternative measures and experimental designs.

A series of studies of identity status among female college students (Marcia & Friedman, 1970; Schenkel, 1975; Schenkel & Marcia, 1972) introduced an additional identity status domain. In Erikson's view, women form personal identities based upon their selection of a sexual partner. This factor was operationalized as attitudes toward premarital sex, and incorporated into the identity status interview. Because of this change, direct comparisons between the studies of males and females were impossible at this time. The findings were nonetheless similar. Like their male counterparts, identity achieved females tended to be low in anxiety and submissiveness to authority. They also tended to choose difficult majors. The moratorium females resembled the achieving females in that they were not submissive to authority, but differed from them by exhibiting much higher levels of anxiety. Just as the male subjects,

foreclosed female subjects subscribed strongly to authoritarianism and displayed little anxiety. Diffuse subjects again were highly anxious; they selected easy majors.

Marcia's identity status interview procedure, however, was time-consuming, difficult to standardize, and cumbersome to administer and score. The use of different procedures for males and females introduced additional complexity and made comparisons difficult. The development of a self-report instrument solved many of these problems (Adams, Shea, & Fitch, 1979; Grotevant & Adams, 1984). The resulting instrument, the Extended Objective Measure of Ego Identity Status (EOM-EIS), is a pencil-and-paper questionnaire that can be easily and quickly administered to large groups. It has subscales covering 2 domains: ideological--relating to occupation, religion, politics, and philosophical lifestyle; and interpersonal--relating to friendship, dating, sex roles, and recreation. Adams, Shea, and Fitch (1979) found that this instrument produced a similar pattern of results to those produced by Marcia's interview technique. Achieved individuals had the highest amount of self-acceptance, while foreclosed subjects were more rigid and complied more readily with authoritarianism. As before, moratorium subjects were similar in self-acceptance to achieved subjects. Furthermore, by using an instrument designed for both sexes, they were able to demonstrate

that there were no significant gender differences within the identity statuses. Grotevant and Adams (1984) validated the instrument with respect to social desirability, to ensure that self-reported responses were not merely reflections of response patterns thought to be more socially desirable. No one status as measured by the EOM-EIS was found to be more socially desirable than any other.

Marcia noted that the identity statuses of achievement and diffusion corresponded closely to Erikson's ego identity and identity diffusion concepts, which functioned as polar alternatives. Marcia described the other two statuses, foreclosure and moratorium, as "additional concentration points roughly intermediate in this distribution" (Marcia, 1966, p. 552). While the identity achievement status was the obvious ideal, Marcia did not specifically outline any progression or sequence of statuses that development would normally follow. However, theoretically one would expect successful identity development to proceed from diffusion through the higher identity statuses, moratorium and achievement (Waterman, 1982).

There have been four longitudinal studies that have tested various assumptions regarding this developmental sequence among college students (Adams & Fitch, 1982; Waterman, Geary, & Waterman, 1974; Waterman & Goldman, 1976; Waterman & Waterman, 1971). These studies showed

that while in general there is a progressive shift to higher identity statuses during the college years, regressive shifts were noted for some of the subjects who had previously achieved a successful resolution to their identity crises. Furthermore, Marcia (1976) found, during a six year follow-up study of adult males, that many high identity status individuals moved to lower identity statuses, particularly foreclosure. Therefore, successful resolution of identity crises does not guarantee the permanence of the commitments formed.

One possible reason for these shifts in identity status is a change in the domain that is the individual's focus of development. The focus model of identity development was first proposed by Coleman (1974, 1978), who suggested that domain issues are addressed sequentially rather than concurrently. Kroger (1986) found support for the idea that the development of a personal identity is not necessarily a global accomplishment, but rather the resolution of a series of distinct domain-specific psychosocial crises. Individuals focus on certain issues at certain times in their lives. One of the most crucial tasks for college-age adolescents is the development of an occupational identity. Indeed, Kroger (1988) found that identity status in the occupational domain was the best overall single predictor of global identity status for college students (65.7 percent of males and 65.9 percent

of females had identical occupational and global identity statuses). The domain combination that best predicted global identity status was that of occupation, religion, and politics (which produced a match for 88.9 percent of males and 100 percent of females). Therefore, it is important to recognize that the individual's focus of development should be taken into account when trying to assess global identity.

Due to these limitations in the current interpretation of the identity status paradigm, Marcia (1976) has proposed that identity status be reinterpreted as a process rather than a state, in order to provide a deeper understanding of the mechanisms for change and growth in the self. He said:

> The problem with the statuses is that they have a static quality and identity is never static. . . . There has always been a process aspect inherent in the determination of identity status. . . . The issue now is to more explicitly define and then measure these process elements. . . . Any adequate theory of identity should have descriptive terms that take this movement into account. (pp. 152-153)

There are many potential advantages for viewing identity change through such a process model. Rather than view identity formation as the final product of adolescence, the way adolescents cope with changes in the self could become the basis for understanding adult identity change. When an issue is resolved in one domain, the adult is then free to move on to another focus of development. Thus, the adult could be viewed as moving from one issue

to another throughout their life time in order to cope with needed changes in the self. Additionally, each identity status could be viewed as a different style of processing information about the self (cf. Berzonsky, 1990). Here, each status may be seen as having adaptive value in allowing the person to cope with potential identity change in such a way that it does not threaten the total self-structure.

Identity Formation as a Process

In his extension of Marcia's work, Berzonsky (1988, 1990) has recently advanced a process model of identity formation based on a constructivist approach. Berzonsky views an individual's developing identity much like a scientific investigation. An individual acts as a scientist actively constructing a theory about himself or herself. This self-theory contains a system of cognitive schemas for guiding future behavior. When the existing cognitive schemas fail to help guide the individual through the process of assimilation, they are disconfirmed, modified, and revised through the process of accommodation. Like a personal scientist, the individual forms an increasingly viable and comprehensive theory for understanding the self through a process of continual confirmations and disconfirmations of anticipated personal experiences.

Berzonsky (1987, 1988) views Marcia's identity statuses as representing three different scientific styles of processing and assimilating self-relevant information. In this view, both achieved and moratorium individuals would share an open style in which they actively seek, process, and utilize self-relevant information prior to developing firm personal beliefs or commitments. Thus, these self-reflective individuals tend to be more <u>information-oriented</u> and adaptable in their self-theories. In contrast, the individuals with a more closed style tend to rely more on the available prescriptions and standards of significant groups in order to meet the expectations of others. Like Marcia's (1966) foreclosed identity status, these more <u>normatively oriented</u> individuals function as dogmatic theorists who tend to defend preexisting self-perceptions rather than revise their self-theories. Lastly, the diffuse style is associated with either a lack of an adequate self-theory or a fragmented self-theory. Individuals who are <u>diffusely oriented</u> rely on the situational demands to determine their behavior and beliefs rather than being directed by an internalized set of commitments and convictions. Berzonsky (1987, p. 8) describes persons adopting this style of functioning as "ad hoc theorists, trying to make do in the short run, but showing limited concern about long-term implications."

Differences in Identity Processing

Recent research examining Berzonsky's theory has used Kelly's (1955) theory of personal constructs to provide a means of testing the structural features of an individual's self-theory. In the view of personal construct theory (PCT), people are active explorers striving to understand and gain some measure of control over their environment. Their primary motivation is to make sense of their experience. According to the tenets of PCT, each person has a unique "personal theory," or world-view, that permits the formulation of "hypotheses," or expectations about what will happen. This mental framework enables people to approach life as a series of "experiments" through which they can continually test and refine their "personal theories." The theoretical parallels between PCT and Berzonsky's theory of different processing styles based on identity status suggest that PCT should provide an excellent way to test Berzonsky's theory.

Several recent studies (Berzonsky & Neimeyer, 1988; Berzonsky, Rice, & Neimeyer, 1990; Neimeyer, Prichard, Berzonsky, & Metzler, 1991) tested for differences in the self-schema structure and processing among the various identity styles. The researchers argued that the more information-oriented self-theorizers should produce better-differentiated self-systems since they actively seek, process, and evaluate self-relevant information.

In contrast, more normatively oriented individuals should develop a self-system that is relatively inflexible, poorly differentiated, and uses biased processing.

In the first exploratory study, Berzonsky and Neimeyer (1988) correlated the subjects' identity status scores with several structural scores. The raw identity status scores were assessed using the Grotevant and Adams (1984) measure of identity status. The structural measures of differentiation and integration for each subject were derived from an elicited 10x10 self-ratings grid. The differentiation measure gives an indication of how many self-schemas are available to the subject, while the integration measure indicates the degree of interrelatedness among these self-schemas. The researchers found that the level of differentiation was positively correlated with moratorium and diffusion scores. The overall pattern of structural scores also showed that diffuse individuals had the lowest integration scores and the highest differentiation scores. Berzonsky and Neimeyer concluded that this pattern of findings lent some support to the theory that diffuse style self-theorists have a fragmented system of self-schemas. "This is the type of self-theory construction one would expect to find if an ad hoc, situation-specific approach were being used" (p. 201). However, this study was limited by its correlational

nature in that making qualitative distinctions among the statuses was not possible.

Therefore, a second study was conducted (Berzonsky, Rice, & Neimeyer, 1990) that employed a between-subjects design. The subjects for this study included only those classified as one of the pure identity status types. Only about one-third of the subjects tested with the Grotevant and Adams (1984) measure can be classified as a pure status type. Results of this study supported the predicted relationship between self-structure and identity style. Information-oriented identity styles were linked to the highest levels of self-system differentiation, whereas normatively oriented foreclosures were associated with the lowest levels of self-schema differentiation. These findings are consistent with the relatively narrow and rigid self-definition of the normatively oriented self-theorist.

In a final study, Neimeyer, Prichard, Berzonsky, and Metzler (1991) tested whether individuals with different identity styles might be disposed toward differential biases in processing occupational information. The researchers expected to find that biased hypothesis testing would occur within groups of individuals whose identity statuses were marked by greater commitment to occupational identity. "Particularly among the more foreclosed individuals, whose firm commitments operate in

the absence of a permeable, information-oriented search process, we would expect to see strong confirmatory bias in relation to relevant occupations, and strong disconfirmation bias in relation to irrelevant occupations" (p. 6). Results provided partial support for their predictions. Although persons in the more committed status groups did, as predicted, engage in significantly more confirmatory bias, the lack of exploration characteristic of foreclosed individuals failed to produce quite as pronounced a confirmatory bias as one might have expected among that group.

Results of the disconfirmatory data furnished additional support for their predictions. Overall, the more information-oriented styles did show less extreme disconfirmatory bias than more normatively oriented (foreclosed status) or diffusely oriented (diffuse status) individuals. "Strong identity commitments were related to greater confirmatory bias, whereas higher levels of identity exploration tended to attenuate disconfirmatory bias as predicted on the basis of their greater information-orientation" (p.12). The researchers concluded that Berzonsky's theory of differential processing due to identity style was supported by this study.

Impact of Identity Style on Autobiographical Memory

Tracing the impact of such schematic and processing differences on autobiographical memory, Neimeyer and Rareshide (1991) argued in their exploratory study that the identity styles marked by greater differentiation and active identity exploration should facilitate greater personal memory recall. In other words, if memory recall is linked to the self-schemata, then individuals whose systems are marked by greater schematic differentiation should show higher levels of personal memory recall. Particularly since information-oriented self-theorists not only define themselves along a wider range of self-schemata, but also actively seek self-relevant information (Berzonsky, 1990; Berzonsky & Sullivan, 1990), they should also be able to generate the greatest range of autobiographical recollections. Particularly in relation to diffuse individuals, who lack a clear self-structure, or normatively oriented individuals who place a premium upon the preservation of existing, limited, self-constructions, the information-oriented identity style should enable higher levels of autobiographical memory recall.

Subjects for this experiment were selected using the Grovtevant and Adams measure of identity status. From this measure, subjects were catagorized into the three identity styles. Using a computer-interactive memory recall procedure designed by Landy (1986/1987), subjects

were presented with four highly descriptive positive characteristics that were either congruent or incongruent with their self-theory. Subjects were then asked to recall "specific incidents in your life when you exemplified or demonstrated that trait" (Landy, 1986/1987, p. 46). From this the total number of memories were recorded.

Results from this experiment provided some support for their hypothesis. As in previous literature (e.g., Markus & Sentis, 1980) subject's overall recollection was greater for events that were consistent with their self-images than for events that were inconsistent. But this tended to vary as a function of identity orientation. When recalling positive memories that supported self-constructions, the highest level of memory recall was evidenced by the information-oriented achievers. However, there was no corresponding support under schema incongruent conditions. Although foreclosed individuals did produce the highest number of incongruent memories, this difference did not reach statistical significance. However, this experiment failed to test the differential impact of both positive and negative personality characteristics. Because foreclosed individuals rely more on the available standards of significant groups in order to meet others' expectations, it seems likely that they would defend more against negative self-perceptions.

Purpose

The purpose of the present study is to test the differential impact of identity style on autobiographical recollections that either confirm or disconfirm positive or negative self-perceptions. Identity style is hypothesized to selectively influence an individual's process of retrieving memories of life experiences. Identity orientations marked by an openness to redefinition and a quest for information should vary in predictable ways from those marked either by the defensive preservation of existing self-constructions or the general absence of such constructions. While autobiographical recall should generally be facilitated by more firmly committed identity structures, the availablity of such recollections should be qualified by the nature of the memory's self-consistency (consistent or inconsistent) and valence (positive or negative).

Hypotheses

1. A main effect for identity style is predicted such that information-oriented and normatively oriented subjects will produce a greater number of autobiographical memories than will diffusely oriented individuals.
2. A main effect for valence of characteristics is predicted such that subjects who recall positive characteristics will recall a greater number of

memories than will subjects who recall negative characteristics.

3. A main effect for valence of characteristics is predicted such that subjects who recall positive characteristics will recall memories more rapidly than subjects who recall negative characteristics.
4. A three-way interaction is predicted among identity style, self-consistency, and valence for the number of memories recalled. Information-oriented individuals should produce more balanced numbers of confirming and disconfirming memories in regard to positive and negative personality characteristics. Normatively oriented identity styles should show a disproportionately large number of self-confirming memories, especially positive ones. Normatively oriented individuals should also produce the fewest number of negative self-disconfirming memories. Diffusely oriented individuals should produce the least number of autobiographical memories and these memories should be equally distributed among the four conditions, suggesting an absence of any systematic bias.
5. A three-way interaction is predicted among identity style, self-consistency, and valence for the latency of memories recalled. Information-oriented individuals should produce more equal response times when confirming and disconfirming memories in regard

to positive and negative personality characteristics. Normatively oriented identity styles should show a disproportionately longer response time when recalling self-disconfirming memories, especially negative ones. Diffusely oriented individuals should produce the shortest response times in all four conditions.

6. For self-disconfirming memories, a two-way interaction between identity style and valence of characteristics is predicted for level of self-change. Diffusely oriented individuals' self-perceptions should vary widely with the nature of the condition of memory recall. Information-oriented individuals are predicted to change their self-perceptions more judiciously but still incorporate self-discrepant information. Normatively oriented individuals are predicted to be the least responsive to changing self-perceptions, particularly when confronted with image-discrepant, negative recollections.

CHAPTER II
METHODS

The present study was designed to explore the relationship between ego identity development and autobiographical memory recall. It was expected that an individual's identity style would carry implications both for that person's ability to retrieve personal memories and also for the impact of these recollections upon that person's self-theory. In order to test these hypotheses, a three-way factorial design was employed. The first factor had to do with the subject's style of processing and assimilating self-relevant information. The three basic identity styles are an information-seeking orientation, a normative orientation, and a diffuse orientation. The next two factors determined the nature of the cues presented to the subject for recall, and thus had to do with the type of memories solicited. The first of these factors, schemata valence, indicated whether the memories related to the subject's positive characteristics or negative characteristics. The final factor, schemata validation, indicated whether the memories were consistent or inconsistent with the subject's own self-theory. The number of memories recalled and the speed of retrieval was assessed. In

addition, since a subject's mood was known to be capable of affecting recall, a measure of depression was used as a check to ensure the equivalency of the groups along this variable.

Subjects

Prior to testing, potential subjects were given a pretest in their introductory psychology classes. The pretest consisted of administering the Extended Objective Measure of Ego Identity Status (EOM-EIS, Grotevant & Adams, 1984). A total of 628 subjects were pretested. From this, 255 people were identified as potential subjects on the basis of their scores on this instrument (106 information-oriented, 56 normatively oriented and 62 diffusely oriented subjects). These subjects were then contacted by telephone and asked to participate in the experiment. A total of 205 people completed the final experiment (132 females and 73 males). The ages of the subjects ranged from 17 to 24, with a mean age of 19 years. All subjects received one experimental credit for completing the pretest, and two credits for participating in the experiment.

Subjects were randomly assigned to the experimental conditions. The experimental conditions were designated by a treatment number so that the experimenters were blind to the condition assigned to each subject. The subjects were tested individually and their anonymity was

assured by the use of subject numbers for identification. While the experimenter introduced and explained each experimental task to the subject, no one was present in the room with the subject during completion of each of the tasks, assuring the subjects of complete privacy.

The EOM-EIS, developed by Grotevant and Adams (1984), measures the overall level of identity development. It is based on the original measure devised by Adams, Shea, and Fitch (1979), which used Marcia's (1966) classification of identity status into four categories. The EOM-EIS contains 64 items: 8 items pertaining to each of the 4 identity statuses (achievement, moratorium, diffusion, foreclosure) for each of 2 domains: ideological (relating to occupation, religion, politics, and philosophical lifestyle) and interpersonal (relating to friendship, dating, sex roles, and recreation). Only the ideological subscale was used in this study because it is more closely tied to the purposes of the project. Using a five-point scale, subjects were asked to rate the degree to which the opinion expressed in each item reflected their own thoughts and feelings. For the total scale, internal consistency ranges from .42 to .84, with test-retest correlations ranging from .63 to .83 over a four-week period. Content validity on the 64 items was established at 96.5% agreement across 10 independent raters (see Grotevant & Adams, 1984).

Subjects' ego identity status was determined during the pretest by their scores on the 32 items of EOM-EIS which apply to the ideological domain. Every item is rated on a scale from 1 to 5. For each of the four identity statuses (diffusion, foreclosure, moratorium, and achievement), there are 8 items for which strong agreement (higher ratings) is characteristic. Summation of the ratings for each of these groups of items produces a set of four subscores ranging from 8 to 40. Each of these subscores for a given subject is compared with the mean for all subjects on that subscore; a subscore more than one standard deviation above the mean is considered a positive indication of the corresponding identity status. Subjects testing positive for exactly one ego identity status were assigned to that status group. Subjects not testing positive for any of the four statuses and subjects testing positive for more than one of the identity statuses were excluded from this study. (See Appendix A.)

Berzonsky (1990) views Marcia's identity statuses as representing three different styles of processing and assimilating self-relevant information. Therefore, in keeping with Berzonsky's theory, the achievement and moratorium status groups were combined to form the information-oriented identity style. The forclosed status group formed the normatively oriented identity

style. Finally, the diffusion status group formed the diffusely oriented identity style.

Procedure

Overview

The experimental procedure for all conditions involved two main steps: the administration of the Zung (1965) depression inventory and the computer-moderated administration of the rating and memory tasks. The procedures relating to the depression questionnaire will be described first, followed by the procedures relating to the tasks performed on the computer.

Administration of the Zung Self-Rating Scale

The subjects were first administered the Zung Self-Rating Scale (ZSRS) for depression. This is a twenty-item questionnaire. Each of the items is a brief statement about how the subject feels or behaves, for example, "I am more irritable than usual." Subjects were directed to rate each statement on a four-point scale, indicating how often the statement applies to them. The four levels on the scale are: "1 - a little of the time," "2 - some of the time," "3 - a good part of the time," and "4 - most of the time." (See Appendix B.)

The ZSRS (Zung, 1965) is intended to provide a quantitative measure of depression. Each item describes

a depressive symptom, indicating on a four-point scale the self-reported frequency of applicability of the item to the subject. Increasing ratings indicate greater agreement with the item. Half of the items are phrased so that agreement is indicative of depression, while the other half are phrased so that disagreement is indicative of depression. The ratings of the latter ten items are reversed prior to scoring. The final score is then the sum of the 20 adjusted ratings, giving a scale from 20 to 80. Higher scores indicate greater degrees of depression. The ZSRS, a brief self-report instrument, has been shown to correlate strongly (0.80) with the Hamilton Rating Scale (HRS), a widely recognized clinician-administered scale (Biggs, Wylie, & Ziegler, 1978). The ZSRS has been shown to be especially appropriate for use with sub-clinical populations.

Administration of the Computer Tasks

The next part of the procedure was moderated by a computer program. The experimenter first familiarized the subject with the computer and outlined the tasks to be performed. The experimenter then initiated the computer program, providing it with the subject's identification number and a code which indicated the subject's experimental condition. The instructions for each task were displayed on the computer screen. The experimenter was present to explain the task and answer

any questions the subject might ask. When the instructions had been completed and the subject was ready to begin each task, the experimenter left the room. At the end of each task the program displayed a message on the screen asking the subject to get the experimenter, who then prepared the subject for the next task.

There were four tasks: schemata ordination ratings, schemata self-description ratings, memory retrieval, and re-rating of the schemata self-descriptions. The procedure performed for each of these tasks will be described below, followed by a discussion of the measures derived from each task. (See Appendix C for an example of the interaction with the computer.)

Prior to beginning the actual rating tasks, the program presented to the subject a generalized six-point practice scale. The endpoints of this scale were unlabelled, and the scale was not presented in conjunction with any item to be rated. The purpose of this scale was to familiarize the subject with the rating metric and to give the subject the opportunity to practice the simple mechanics of selecting a rating using the computer keyboard. One at a time, the program displayed a mark next to each of the six rating points. The subject had to enter the corresponding rating (by pressing the number key matching the marked item) in order to continue. This practice exercise was used to develop uniformity in response times (in order to ensure

that variations in the measured responses was not due to differential accessibility of the six rating keys). Previous work has shown that this practice exercise is sufficient to provide uniformity of response to within 500 milliseconds (Landy, 1986/1987). After completion of the practice scale, the first actual rating task was begun.

Schemata ordination. The first rating task involved schemata ordination. This task consisted of rating a construct, presented as a pair of traits, on a six-point scale representing the personal importance each subject attached to that construct (see Appendix C). The scale is "not at all important 1 2 3 4 5 6 very important." A total of 28 constructs were presented. The pairs of traits used were identical with those used by Landy (1986/1987). (See Appendix D for a description of how words were selected.) The first three constructs, although not distinguished from the remaining 25, were presented in the same order for all subjects, and served merely as practice items to orient the subjects to this rating task. The remaining 25 constructs were the same for all experimental subjects, but were presented to each subject in a randomized order. The program recorded each response.

Schemata self-description. The next task was schemata self-description rating. It was similar to the previous task in that the subject was again asked to rate

a series of items on a six-point scale. In this case, however, the items were individual traits rather than trait pairs. The scale represented the degree to which the subjects felt that each trait was self-descriptive. The scale was given as "not me 1 2 3 4 5 6 me." A total of 53 traits were presented. As before, the first three items, unbeknownst to the subjects, were practice items only. The remaining 50 items, presented in a different random order to each subject, were the individual traits making up the same 25 trait pairs used in the schemata ordination task. As before, the program recorded each response in order to use the ratings to select items for the memory retrieval task.

Memory retrieval. The third of the computer-moderated tasks was the memory retrieval task. Four traits were presented one at a time. The subjects were told that they would be allotted one and one-half minutes to consider each trait. They were instructed to attempt to recall as many distinct incidents as possible in which they displayed the given trait. They were told to press the clearly marked "Enter" key on the computer keyboard as soon as they recalled each incident, and then to write down a word or brief phrase which would help them identify the memory later. (In addition to the on-screen directions, a printed copy of the instructions for this task was made available to each subject.) At the end of the allotted time for each trait, the program

issued an audible signal (a "beep") and displayed a message instructing the subjects to stop. The subjects were given 15 seconds to relax and re-orient between traits. After all four traits had been presented, the subjects were instructed to supply an approximate date (month and year) when each incident occurred. (See Appendix E for a description of the operation of the program and the criteria for selection of cues.)

Re-rating schemata self-description. The fourth and final computer-moderated task was a repetition of the schemata self-description task described above. All 53 traits, including the practice traits, were presented once again in random order. The traits were rated on the same six-point "not me 1 2 3 4 5 6 me" scale. Completion of this task finished the computer-moderated portion of the experiment. All data were recorded in a file on disk for later processing, and the computer program ended.

Measures derived from the computer tasks. Two measures of the subject's ability to retrieve memories in response to the presented cue were derived from this part of the procedure. The program recorded the number of responses to each trait (retrieval quantity) and the delay in responding (retrieval latency). Additionally, a third measure was derived from the difference in self-description ratings before and after the memory retrieval task (self-change index).

Retrieval quantity refers to the number of distinct memories recalled in response to a particular cue (Landy, 1986/1987). As each trait was presented to the subject on the computer screen during the memory retrieval task, the subject signalled the remembrance of a particular incident relating to personal expression of the trait by pressing the "Enter" key. The program recorded the keypress signal, providing a count of the number of memories recalled for each trait. The subject also recorded the incident, and later supplied an approximate day and year, ensuring that each incident corresponded to a specific, distinct event. The counts from the computer record and the dated list were cross-checked against each other, to provide verification of the accuracy of this measure. The counts were then averaged in order to provide a single score.

Retrieval latency is a measure of the delay between the presentation of a retrieval cue and an indication from the subject that a memory has been accessed in response to that cue (Landy, 1986/1987). The computer program monitoring the memory retrieval task, using the same keypress signal described above, recorded the elapsed time between the display of the trait on the computer screen and the retrieval of the first memory, as well as the elapsed time between subsequent memory retrievals. All timings were recorded to the nearest tenth of a second. From these, the mean retrieval

latency was calculated as the sum of the elapsed times divided by the number of memories recalled.

The self-change index is a measure of the total difference in self-description ratings on the four recall cues from before the recall task to after the recall task. The ratings corresponding to each cue for time 1 were subtracted from the ratings for time 2, and these four differences were summed.

Summary of Procedure

The procedure essentially comprised two steps: first, administration of the Zung questionnaire. Second, the interactive computer tasks, which consisted of schemata ordination, self-description rating, memory retrieval, and a repeat of the self-description rating.

Design and Analysis

Three independent variables were manipulated in a 3x2x2 factorial between subjects design. The first factor referred to information-oriented, normatively oriented, and diffusely oriented identity styles, as determined during pretesting using the EOM-EIS. The second factor referred to schemata evaluation and comprised two levels: positive personal characteristics and negative personal characteristics. The third factor, schemata validation, comprised two levels: self-confirmation and self-disconfirmation.

The present study investigated three dependent measures, two of which pertained to memory retrieval, and one of which dealt with cognitive change. The memory retrieval measures, Retrieval Quantity and Retrieval Latency, were recorded by the computer program monitoring the memory retrieval task. The Self-Change Index was derived from the ratings also recorded by that program.

A one-way ANOVA with three levels of identity style was conducted using the dependent measure Retrieval Quantity to test Hypothesis 1. A series of t-tests were conducted using the dependent measures of Retrieval Quantity and Retrieval Latency to test Hypotheses 2 and 3. A series of three-way ANOVAs (3x2x2) were conducted using the dependent variables Retrieval Quantity and Retrieval Latency to test Hypotheses 4 and 5. A two-way ANOVA (3x2) was conducted using the dependent measure Self-Change Index to test Hypothesis 6.

CHAPTER III
RESULTS AND ANALYSIS

A series of 3x2x2 ANOVAs were conducted to analyze the effects of identity style, cue valence, and validation on the pretest for depression, the total number of memories recalled, and the latency of recall. In addition, a 3x2 ANOVA was performed to test the effects of identity style and cue valence on the subjects' perceived self-change when they recalled self-disconfirming personal characteristics. All of the independent variables were between-subjects factors.

Pretests

Prior to conducting the primary analyses, two pretests were conducted. First, in order to determine if identity style might be linked to subjects' memory recall ability, 15 subjects were asked to complete the EOI-EMS and the Digit Span subtest of the Wechsler Adult Intelligence Scale Revised (Fantuzzo, Blakey, & Gorsuch, 1989). The Digit Span subtest measures immediate recall memory. A series of Pearson's correlations were performed between the three raw identity scale scores (with the score for the information orientation being the mean of the achievement and moratorium subscale scores)

and the total score for the Digit Span test. All three correlations failed to reach significance (range $\underline{r}$ = -.16 to $\underline{r}$ = .11), suggesting that any differences in memory recall among the identity styles are not due to general differences in memory ability.

Second, because depression has been shown to influence memory recall, subjects were asked to complete the Zung depression scale, and a 3x2x2 ANOVA was conducted on the depression scores in order to confirm that subjects in the various cells were not differentially depressed. Analysis of the Zung scores confirmed that subjects' level of depression did not differ significantly across conditions. There were no significant main effects or interactions, as reflected in Table 1. Table 2 provides the mean depression scores for each condition.

Primary Analyses

The data for the first two dependent measures (Retrieval Quantity and Retrieval Latency) were analyzed using a 3 (information-oriented, normatively oriented, and diffusely oriented) x 2 (positive and negative memory cues) x 2 (self-confirming and self-disconfirming) between-subjects analysis of variance (ANOVA).

Table 1. Analysis of Variance for Depression Scores

Source	Sum of Squares	df	Mean Square	F	p
Identity Style	80.995	2	40.497	0.91	.4027
Valence	6.282	1	6.282	0.14	.7070
Identity Style x Valence	116.582	2	58.291	1.32	.2707
Validation	3.099	1	3.099	0.07	.7917
Identity Style x Validation	1.077	2	0.539	0.01	.9879
Valence x Validation	0.233	1	0.233	0.01	.9422
Identity Style x Valence x Validation	213.339	2	106.670	2.41	.0928
Error	8552.281	193	44.312		

Table 2. Means and Standard Deviations for Depression Scores

Identity Style	Valence	Validation	N	Zung Score Mean	Zung Score S. D.
Information	Positive	Confirm	26	33.81	7.50
Information	Positive	Disconfirm	28	35.79	7.41
Information	Negative	Confirm	25	35.64	8.24
Information	Negative	Disconfirm	27	34.04	4.27
Normative	Positive	Confirm	12	36.75	5.83
Normative	Positive	Disconfirm	12	38.33	5.41
Normative	Negative	Confirm	12	35.08	5.74
Normative	Negative	Disconfirm	10	34.50	6.22
Diffuse	Positive	Confirm	10	36.70	4.27
Diffuse	Positive	Disconfirm	14	33.71	5.24
Diffuse	Negative	Confirm	16	35.19	8.27
Diffuse	Negative	Disconfirm	13	38.38	7.10

Retrieval Quantity

A three-way ANOVA performed on the total number of memories recalled revealed two significant main effects, one significant two-way interaction and one three-way interaction (See Table 3). Main effects were found for valence, $F(1, 205) = 34.82$, $p < .0001$, and for identity style, $F(2, 205) = 3.84$, $p < .02$, but these were qualified by a two-way interaction between valence and validation, $F(1, 205) = 5.16$, $p < .02$, and a three-way interaction among identity style, valence, and validation, $F(2, 205) = 4.38$, $p < .01$.

The two main effects reflected that subjects did tend to recall more positive memories ($M = 18.94$) than negative memories ($M = 11.23$) and that memory recall varied as predicted according to identity style. A Student-Newman-Keuls analysis with $p < .05$ revealed that the highest numbers of autobiographical memories were reported by information-oriented individuals ($M = 16.60$), followed by normatively oriented ($M = 14.65$) and diffusely oriented ($M = 12.35$) individuals.

However, these main effects were qualified by two interactions. Using a Student-Newman-Keuls analysis the two-way interaction between valence and validation showed that under conditions of self-confirmation, subjects tended to recall significantly more memories when presented with positive self-characteristics ($M = 18.08$) than when asked to confirm negative self-characteristics

Table 3. Analysis of Variance for Retrieval Quantity

Source	Sum of Squares	df	Mean Square	F	p
Identity Style	699.706	2	349.853	4.15	.0171
Valence	2127.172	1	2127.172	25.25	.0001
Identity Style x Valence	394.931	2	197.466	2.34	.0987
Validation	25.160	1	25.160	0.30	.5853
Identity Style x Validation	126.432	2	63.216	0.75	.4735
Valence x Validation	434.457	1	434.457	5.16	.0243
Identity Style x Valence x Validation	738.475	2	369.237	4.38	.0138
Error	16257.967	193	84.238		

(M = 11.83; see Figure 1). However, when subjects were presented with self-disconfirming characteristics, they recalled significantly more memories when presented with positive characteristics that were not like themselves (M = 19.70) than when asked to recall memories of negative characteristics that were not like themselves (M = 10.60).

This interaction, however, was qualified by a three-way interaction among identity style, valence, and validational conditions. As Table 4 indicates, the three identity styles reported significantly different patterns of recollections across the four recall conditions. As predicted, and illustrated in Figure 2, information-oriented individuals produced a relatively balanced number of self-confirming and self-disconfirming memories for both positive and negative characteristics. When subjects were asked to recall positive characteristics, a Student-Newman-Keuls conditional analysis revealed that they recalled both self-confirming (M = 22.57) and self-disconfirming memories (M = 19.89) with the same frequency. Likewise, information-oriented subjects recalled both self-confirming memories (M = 11.20) and self-disconfirming memories (M = 12.44) with equal frequency (see Figure 2).

In contrast, as predicted, normatively oriented individuals tended to recall more positive self-confirming memories and fewer negative

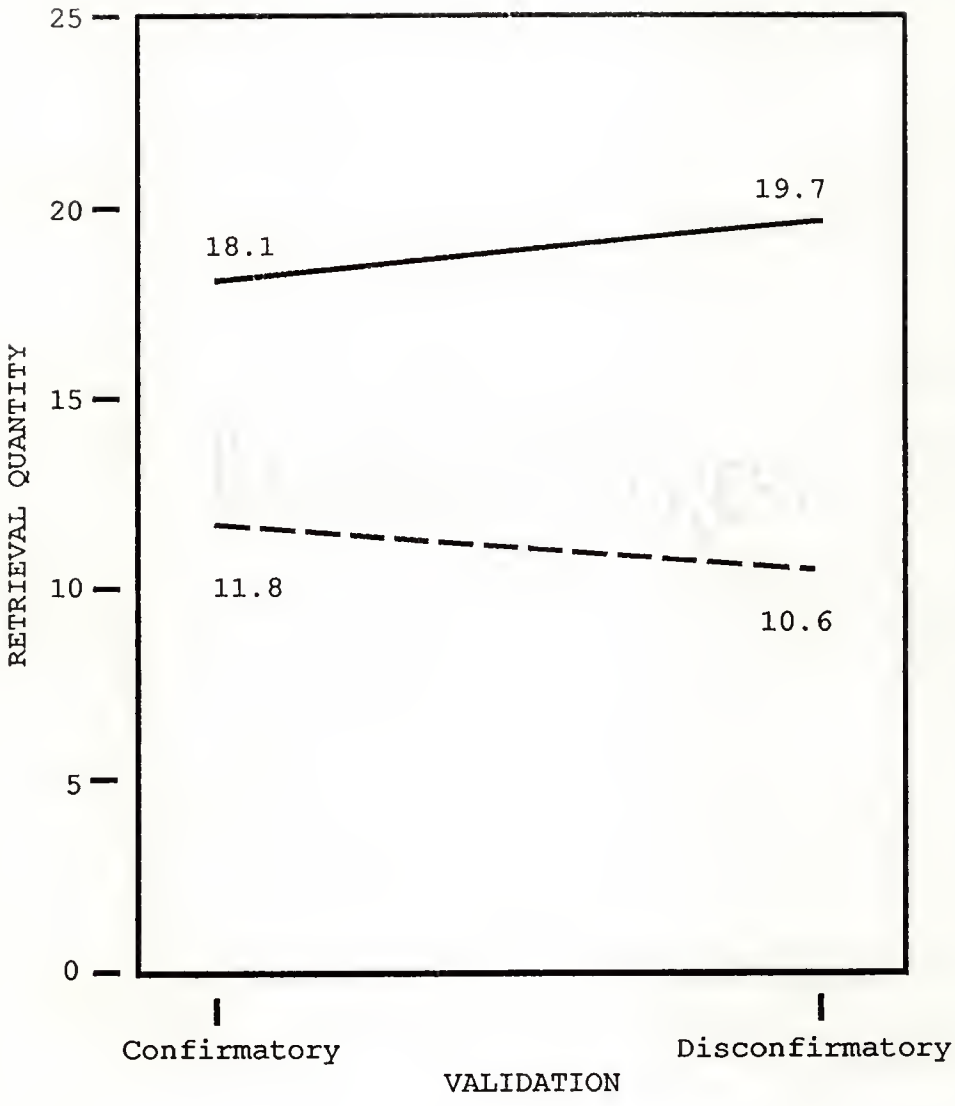

Figure 1. Effects of valence and validation on total number of memories recalled.

Table 4. Means and Standard Deviations for Memory Retrieval Measures

Identity Style	Valence	Validation	N	Quantity Mean	Quantity S. D.	Latency Mean	Latency S. D.
Information	Positive	Confirm	26	22.58	9.85	14.23	4.59
Information	Positive	Disconfirm	28	19.89	12.69	15.64	8.43
Information	Negative	Confirm	25	11.20	6.48	19.29	7.31
Information	Negative	Disconfirm	27	12.44	6.41	17.94	6.39
Normative	Positive	Confirm	12	15.75	14.12	18.09	9.23
Normative	Positive	Disconfirm	12	21.50	10.37	14.02	4.35
Normative	Negative	Confirm	12	13.00	9.85	20.68	8.99
Normative	Negative	Disconfirm	10	7.10	6.14	23.58	15.05
Diffuse	Positive	Confirm	10	9.20	6.58	23.45	13.15
Diffuse	Positive	Disconfirm	14	17.79	10.02	12.99	4.98
Diffuse	Negative	Confirm	16	11.94	6.42	20.40	5.55
Diffuse	Negative	Disconfirm	13	9.46	5.11	21.31	8.92

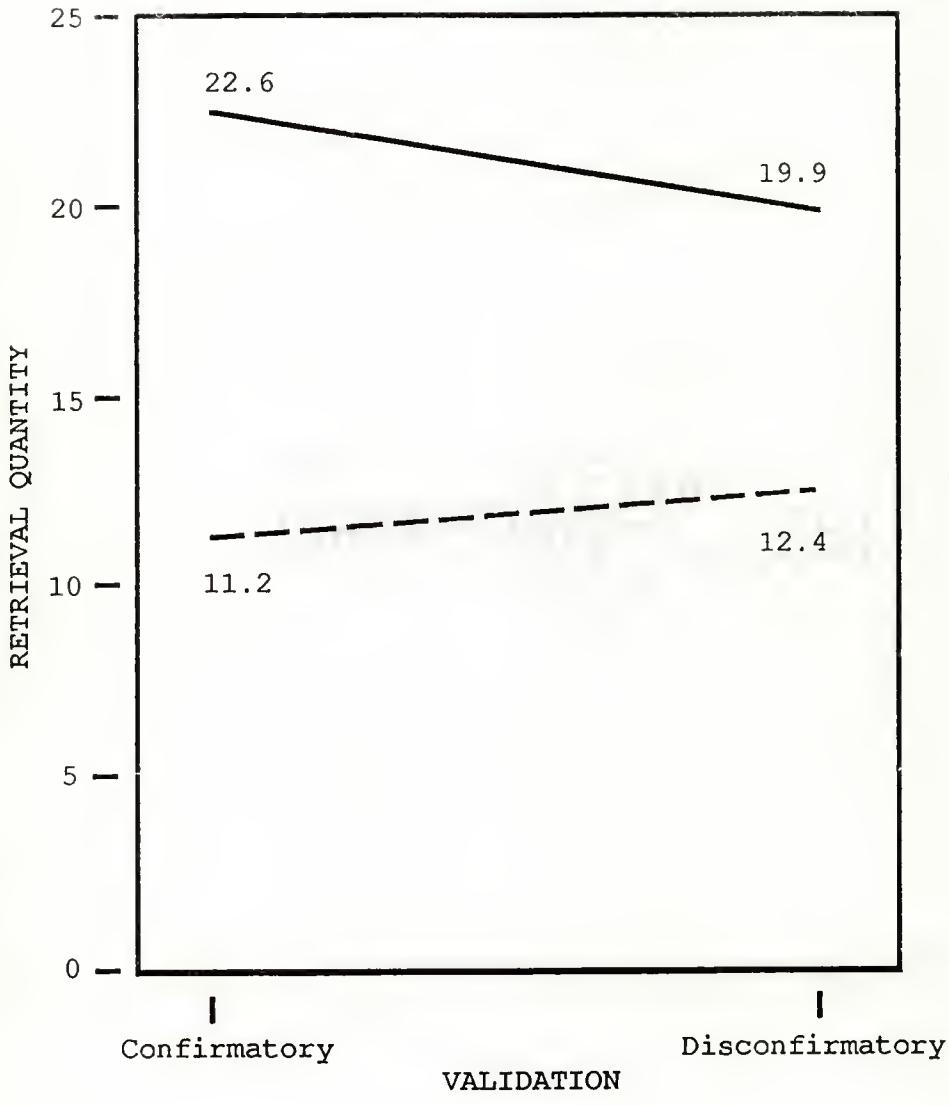

Figure 2. Effects of valence and validation on total number of memories recalled for information-oriented subjects only.

self-disconfirming memories. A Student-Newman-Keuls conditional analysis demonstrated that subjects in the self-confirming conditions recalled similar numbers of positive (M = 15.75) and negative (M = 13.00) autobiographical memories (see Figure 3). In contrast, subjects in self-disconfirming conditions differed significantly in their recall of positive and negative memories. The number of negative self-disconfirming memories recalled (M = 7.10) was significantly lower than the number of positive self-disconfirming memories (M = 21.5; see Figure 3), suggesting the operation of a robust self-enhancement effect.

Finally, as predicted, diffusely oriented individuals recalled an equal number of autobiographical memories among the four recall conditions. A Student-Newman-Keuls conditional analysis revealed that differences in the number of memories recalled across both self-confirming conditions (positive M = 9.20, negative M = 11.93) and self-disconfirming conditions (positive M =17.78, negative M = 9.46) proved to be insignificant (see Figure 4).

Retrieval Latency

Viewed as a second indicator of the accessiblity of autobiographical memories, data concerning the mean latency of memory recall was analyzed according to the 3x2x2 factorial design. The three-way ANOVA revealed one

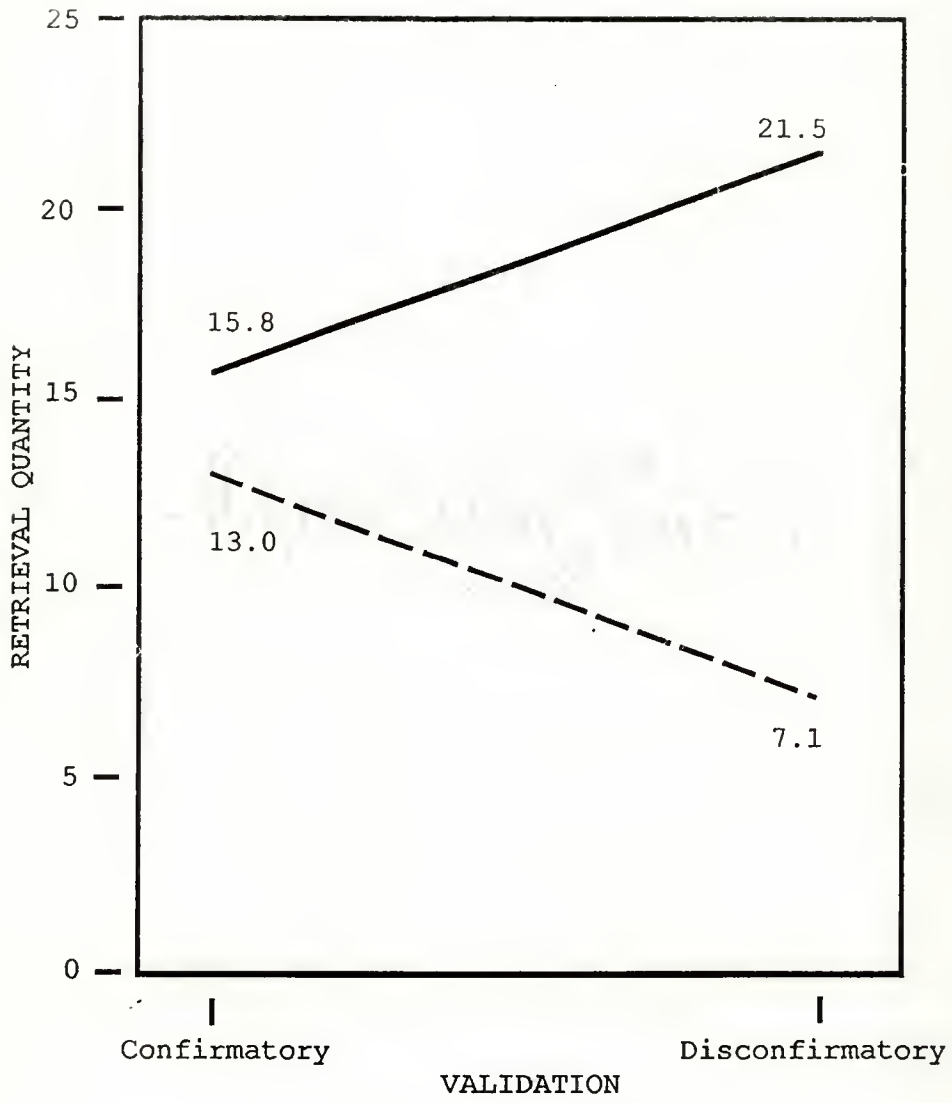

Figure 3. Effects of valence and validation on total number of memories recalled for normatively-oriented subjects only.

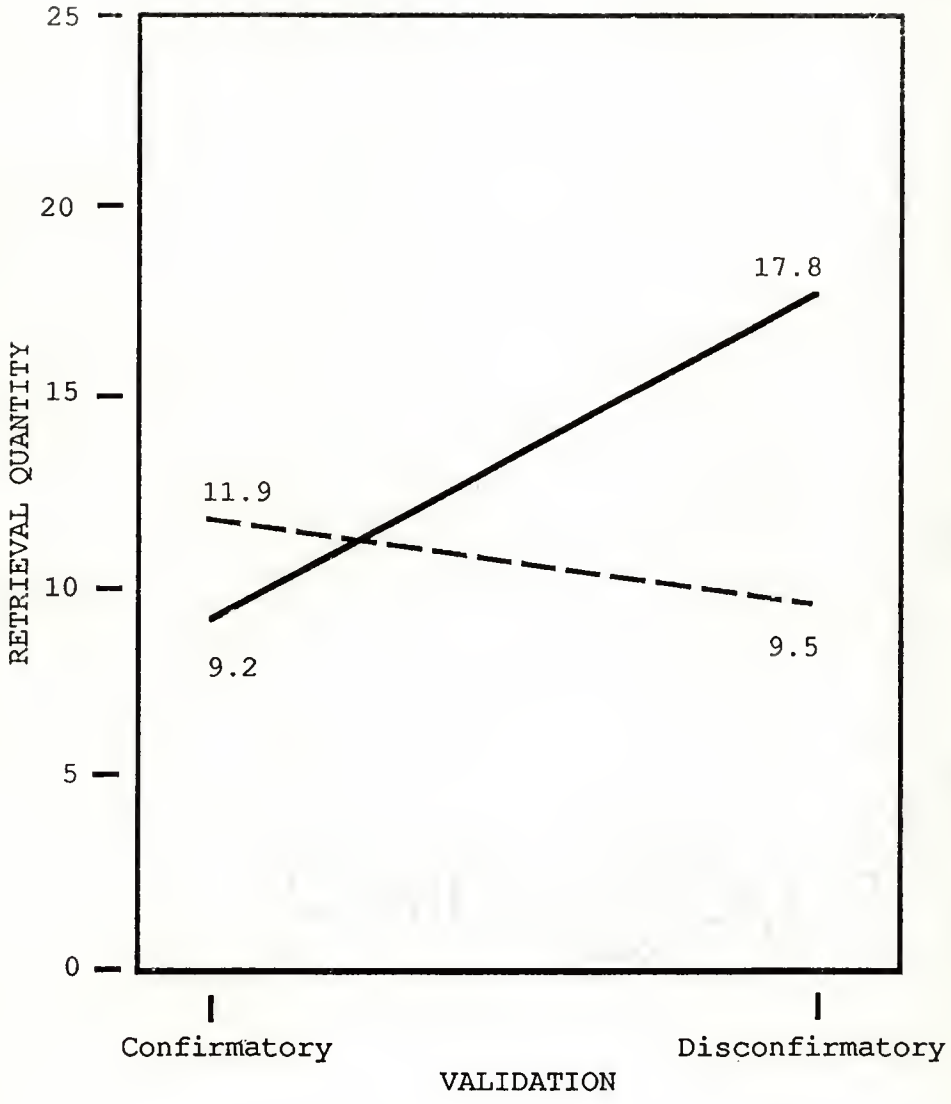

Figure 4. Effects of valence and validation on total number of memories recalled for diffusely-oriented subjects only.

significant main effect, one significant two-way interaction and one three-way interaction (see Table 5). Main effects were found for valence, $F(1, 205) = 12.02$, $p < .0006$, and a tendency toward a main effect for identity style, $F(2, 205) = 2.66$, $p < .07$. However, these were qualified by a two-way interaction between valence and validation, $F(1, 205) = 4.75$, $p < .03$ and a three-way interaction among identity style, valence, and validation, $F(2, 205) = 3.89$, $p < .02$.

Support was found for the hypothesis that memories related to positive characteristics would be recalled more quickly than would negatively cued memories. The main effect for valence reflected the fact that subjects did tend to recall positive memories more quickly (M = 15.78 seconds) than negative memories (M = 19.94 seconds). The tendency toward a significant difference among the various identity styles in terms of response times indicated that the diffusely oriented subjects produced the longest response times overall (M = 19.2 seconds) compared to the normatively oriented subjects (M = 18.9 seconds) and the information-oriented subjects (M = 16.7 seconds).

However these effects were qualified by two interactions. Using a Student-Newman-Keuls analysis, the two-way interaction between valence and validation showed that under conditions of self-confirmation, subjects tended to recall memories significantly more quickly when

Table 5. Analysis of Variance for Retrieval Latency

Source	Sum of Squares	df	Mean Square	F	p
Identity Style	335.105	2	67.552	2.66	.0725
Valence	757.341	1	757.341	12.02	.0006
Identity Style x Valence	76.060	2	38.030	0.60	.5478
Validation	140.274	1	140.274	2.23	.1372
Identity Style x Validation	208.281	2	104.141	1.65	.1941
Valence x Validation	298.994	1	298.994	4.75	.0306
Identity Style x Valence x Validation	490.279	2	245.139	3.89	.0220
Error	12156.605	193	62.988		

presented with positive self-characteristics (M = 17.1 seconds) than when asked to confirm negative self-characteristics (M = 19.9 seconds; see Figure 5). In a similar way, subjects who were presented with positive characteristics that were not like themselves recalled memories significantly more quickly (M = 14.5 seconds) than when asked to recall memories of negative characteristics that were not like themselves (M = 19.9 seconds).

This interaction, however, was qualified by a three-way interaction among identity style, valence, and validational conditions. As Table 6 indicates, the three identity styles reported significantly different patterns of response times across the four recall conditions. As predicted, information-oriented individuals produced equal response times for self-confirming and self-disconfirming memories for both positive and negative characteristics. When subjects were asked to recall positive characteristics, a Student-Newman-Keuls conditional analysis revealed that they recalled both self-confirming memories (M = 14.2 seconds and self-disconfirming memories (M = 15.6 seconds) with the same speed of recall. Negative memories were recalled with similar speed overall with information-oriented subjects recalling both self-confirming memories (M = 19.3 seconds) and self-disconfirming memories (M = 17.9 seconds) with equal ease (see Figure 6).

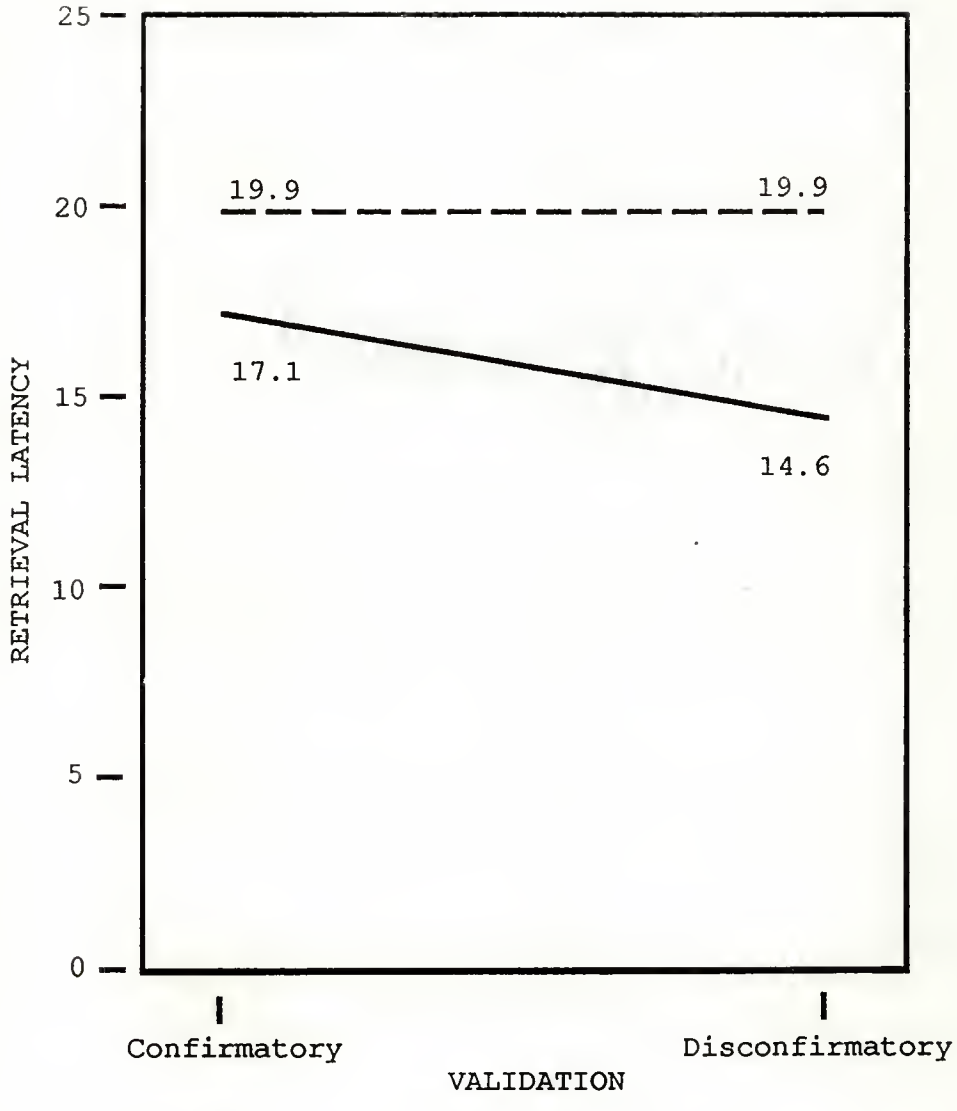

Figure 5. Effects of valence and validation on average time to retrieve memories (in seconds).

Table 6. Analysis of Variance for Self-Change Scores

Source	Sum of Squares	df	Mean Square	F	p
Identity Style	9.077	2	4.539	1.70	.1875
Valence	29.750	1	29.750	11.16	.0012
Identity Style x Valence	5.639	2	2.820	1.06	.3511
Error	307.385	98	2.665		

Table 7. Means and Standard Deviations for Self-Change Scores

Identity Style	Valence	N	Self-Change Mean	S. D.
Information	Positive	28	1.32	0.82
Information	Negative	27	2.22	1.97
Normative	Positive	12	1.42	1.16
Normative	Negative	10	2.10	1.79
Diffuse	Positive	14	1.50	0.94
Diffuse	Negative	13	3.38	2.69

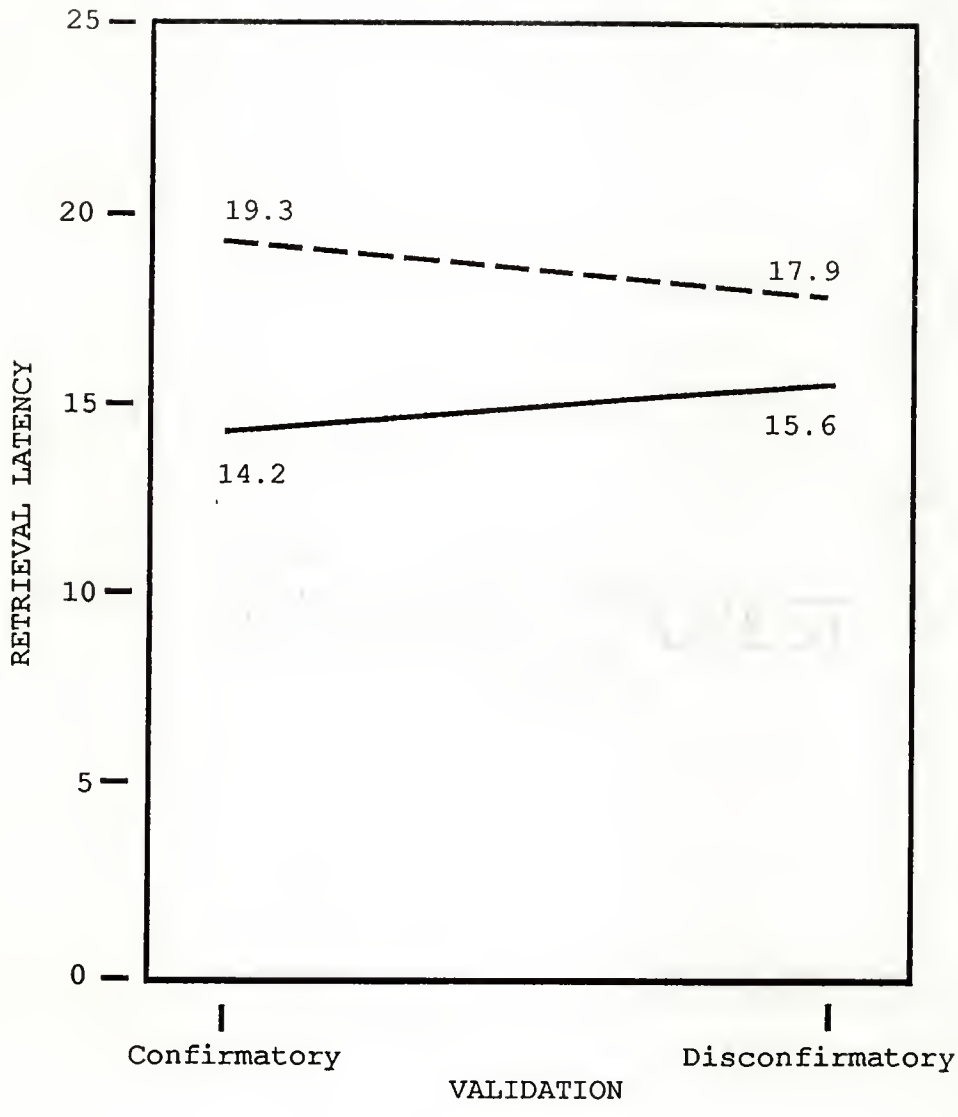

Figure 6. Effects of valence and validation on average time to retrieve memories (in seconds) for information-oriented subjects only.

Partial support was found for the prediction that normatively oriented individuals would show a disproportionately longer response time when recalling self-disconfirming memories, especially for negative self-characteristics. A Student-Newman-Keuls conditional analysis demonstrated that under self-disconfirming conditions, normatively oriented subjects did significantly differ in their response times. The latency of recall for negative self-disconfirming memories ($\underline{M}$ = 23.6 seconds) was significantly higher than for positive self-disconfirming memories ($\underline{M}$ = 14.0 seconds; see Figure 7).

Finally, partial support was found for the prediction that diffusely oriented individuals would produce response times with relatively equal latency among the four recall conditions, the exception being the rapidity with which they recalled positive, but self-disconfirming, memories (see Figure 8).

Self-Change

The final analyses addressed the relative degrees of perceived self-change among the three identity styles following the recall of autobiographical memories. Because the two validational conditions (positive/confirm, negative/confirm) involved subjects generating memories that were viewed as highly self-descriptive characteristics (i.e., rated as 5 or 6

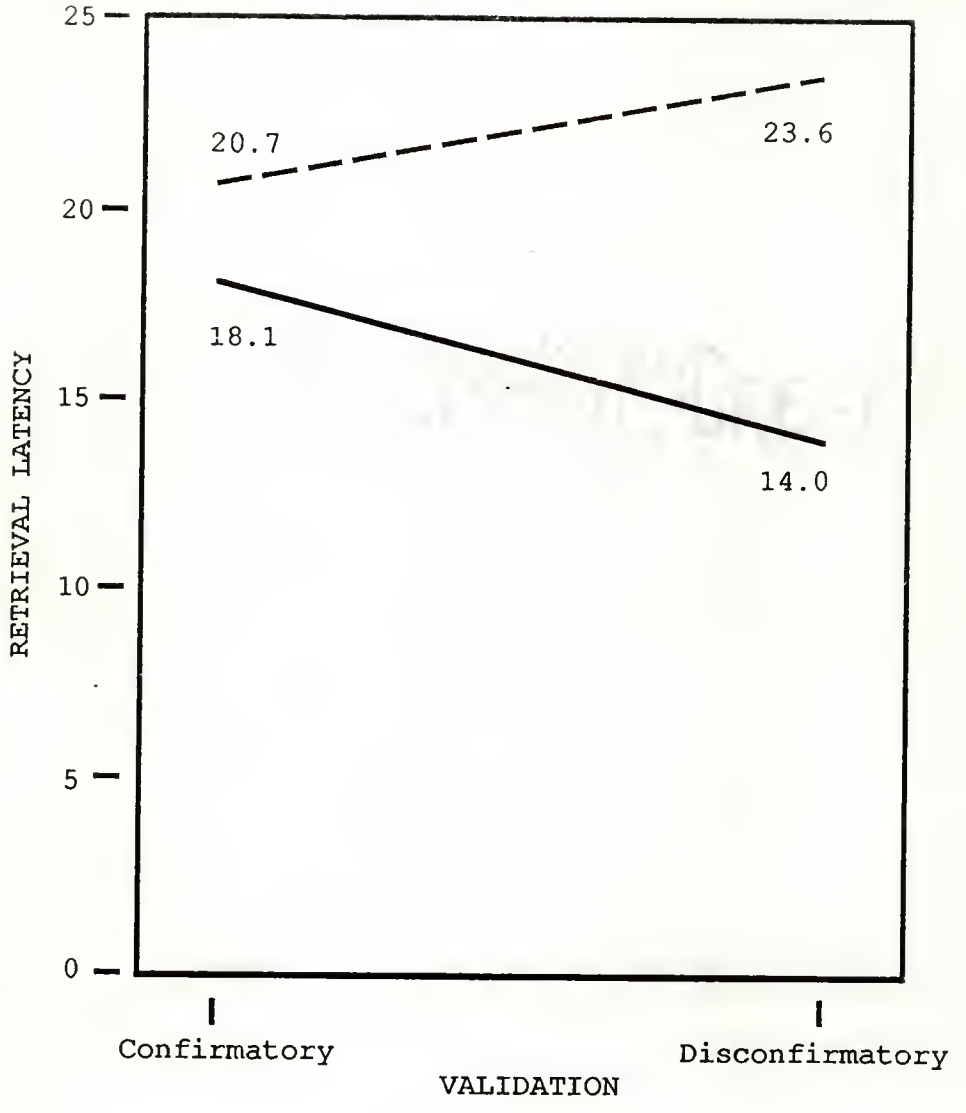

Figure 7. Effects of valence and validation on average time to retrieve memories (in seconds) for normatively-oriented subjects only.

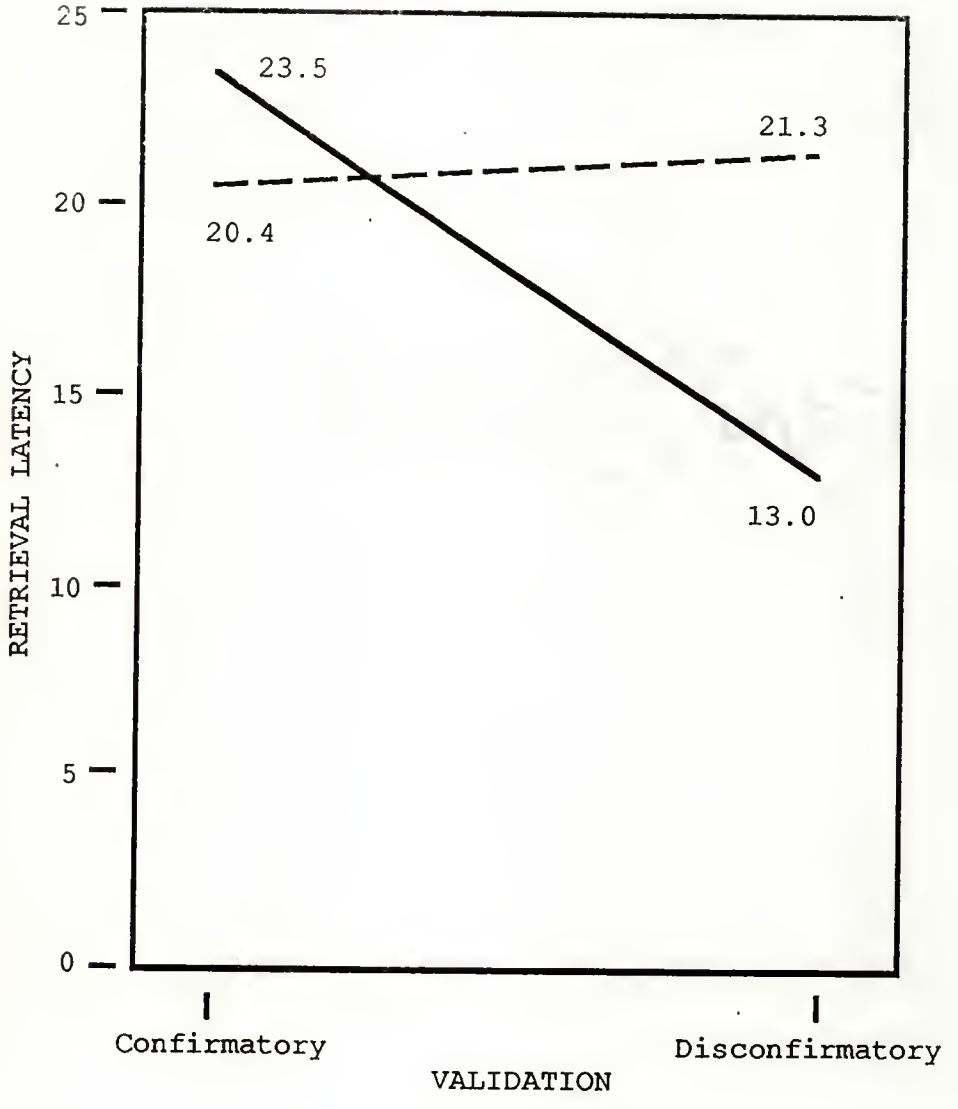

Figure 8. Effects of valence and validation on average time to retrieve memories (in seconds) for diffusely-oriented subjects only.

on a six-point scale), these conditions were subject to a ceiling effect. For this reason, these conditions could not be used in the analysis of perceived change, since they could change little as a function of validation. Conditions of invalidation (positive/disconfirm; negative/disconfirm), however, reflected memory recall along dimensions that were initially low in self-descriptiveness (i.e., rated as 1 or 2 on a six point scale) and for that reason could be subject to modification if disconfirmed. In other words, these originally non-self-descriptive characteristics might become more self-descriptive as a function of reviewing memories illustrating their applicablity to the self.

Changes under the positive/disconfirm condition would reflect the individual's willingness to relinquish negative self-constructions. Likewise, changes under the negative/disconfirm condition would reflect the individual's willingness to relinquish positive self-constructions.

A two-way ANOVA performed on the time two self-ratings revealed two significant main effects. The main effect for valence $\underline{F}(1, 104) = 12.01$, $\underline{p} < .0008$ showed that, overall, subjects regarded the positive cues as more self-descriptive ($\underline{M} = 20.0$) than the negative cues ($\underline{M} = 7.7$). A Student-Newman-Kuels analysis of the second main effect for identity style revealed that diffusely oriented subjects had the highest level of

self-similarity ($\underline{M}$ = 15.0) while normatively oriented individuals reported the lowest amount of perceived self-similarity ($\underline{M}$ = 13.3). The level of perceived self-similarity for information-oriented subjects fell between the other identity styles ($\underline{M}$ = 14.0). Although these findings failed to show the predicted interaction between identity style and valence, these results lend partial support for hypothesis six, by suggesting the relative resistance to disconfirmation associated with the normatively oriented identity style.

CHAPTER IV
DISCUSSION AND CONCLUSIONS

Results of this study provide support for the relationship between identity development and autobiographical memory recall. Central to this study has been the renewed interest in the relationship between personality and memory in general, as well as in the specific transformations in recall that may accompany personal change and reconstruction (Barclay, 1986, 1988a, 1988b; Barclay & Subramaniam, 1987; Brewer, 1988; Kihlstrom, 1981; Markus, 1977; Markus & Sentis, 1980; Ross & Conway, 1986). This study has followed from the recognition of personal identity and personal memory as interdependent processes. This conceptualization of the self is broadly consistent with George Kelly's view of people acting as personal scientists who continuously strive to evolve and preserve a meaningful sense of self. Bartlett's (1932) work supported this study's view that autobiographical recall is more than the literal reproduction of psychologically embalmed events, but as he aptly put it, is instead "far more decisively an affair of reconstruction."

As evidence of the self's role in the reconstruction, fabrication, and revision of history

continues to mount, the importance of addressing the function or purpose of such efforts continues to draw attention. Consistent with other accounts (e.g., Greenwald, 1980), this study regarded the preservation of a meaningful sense of self-identity as an important factor in this reconstructive process (see Kelly, 1955), and predicted that important differences in identity development could carry implications for autobiographical recall.

The specific hypotheses for this project have been derived from Berzonsky's (1987, 1988, 1990) conceptualization of identity style which emphasizes the differential processes associated with information-oriented, normatively oriented, and diffusely oriented personal scientists. As relatively objective processors, information-oriented individuals actively seek self-relevant information and willingly embrace and assimilate viable reconstructions of the self. Concerning contemporary self-images, information-oriented individuals would be "skeptical and tentative about their self-constructions, responsive to environmental feedback, and willing to test and revise self-constructs in light of contradictory evidence" (Berzonsky, 1990, p.177). In contrast, normatively oriented individuals, who have arrived at current identity commitments in the absence of personal exploration or crisis, are primarily geared toward the preservation of existing self-constructions.

Having foreclosed prematurely on readily available, externally provided self-images, they operate as dogmatic scientists who rely on assimilative processes such as rationalization and confirmation-biased searches in testing images of themselves. And finally, diffusely oriented individuals are characterized as "ad hoc" self-theorists who continually engage in ephemeral accommodative changes in response to the vagaries of immediate contextual demand (see Berzonsky, 1988, 1990).

These broad-based differences in personal identity should carry implications for the nature of the transaction that occurs between self-constructions and recollections. Accordingly, the number of autobiographical memories recalled, the latency of that memory recall, and the impact of that recall on subsequent self-perceptions, all varied with the style of identity development that the individual brought to bear in forging a sense of self.

Implications of the Results

Overall, information-oriented individuals generated the greatest number of autobiographical recollections and, as predicted, diffusely oriented individuals generated the fewest. More importantly, this recall varied across conditions, with information-oriented individuals showing the highest recollection among the three identity styles for memories that supported

positive self-perceptions, as well as the greatest ability to generate memories that threatened those self-perceptions. This latter effect is particularly compelling in light of the fact that the number of negative self-discrepant memories generated by the information-oriented individuals were almost double that of the normatively oriented subjects whose predisposition was toward the preservation of central self-images. This pattern of findings supports the relatively greater receptivity of information-oriented individuals to negative identity-discrepant information. It also supports other research which found that normatively oriented individuals tend to employ constriction and withdrawal under ego-threatening conditions (Waterman & Waterman, 1974).

Furthermore, looking across the four memory recall conditions, these data invite some intriguing speculations that may be worthy of further attention. For example, contrary to predictions, it does not appear that normatively oriented individuals engaged in markedly greater confirmatory memory recall than did information-oriented individuals. Indeed, there was remarkedly little discrepancy between levels of confirmatory and disconfirmatory memory recall for any of the identity styles. However, if the data are examined in relation to self-enhancement effects, some potentially interesting tendencies emerge. Self-enhancement in this

study would be defined by the tendency to generate relatively greater numbers of positive than negative memories, regardless of their consistency with self-perceptions. Viewed from this perspective, both the information- and normatively oriented individuals appeared to engage in greater self-enhancement than did diffusely oriented individuals. In this regard the information-oriented individuals generated significantly more positive ($\underline{M}$ = 21.23) than negative ($\underline{M}$ = 11.82) memories, as did the normatively oriented subjects (positive $\underline{M}$ = 18.63; negative $\underline{M}$ = 10.05). Only the diffusely oriented identity style was marked by relatively greater balance in the number of favorable ($\underline{M}$ = 13.49) and unfavorable ($\underline{M}$ = 10.67) memories recalled. One possible interpretation of this effect concerns the endemic function of identity development to preserve a favorable sense of self. In this regard such biases may be viewed as "indicating that ego's cognitive biases are pervasive and characteristic of normal personalities ... as manifestations of an effectively functioning organization of knowledge" (Greenwald, 1980, p.603).

This general picture of autobiographical recall as influenced by differences in personal identity is strengthened by considering the impact of that memory recall on subsequent self-perceptions. Consistent with their accommodative orientation to situational contexts, diffusely oriented individuals showed the greatest

changes in self-perceptions following the recall of memories that were inconsistent with positive and negative self-images. As expected, normatively oriented individuals showed the least change, again underscoring their preference for assimilation over personal revision or accommodation. This finding is consistent with the findings of Berzonsky and Sullivan (1990) who concluded from their factor analytic study of identity styles that "normatively oriented individuals may cordon off a core of the self from potential threats of invalidation" (p. 14). It is also consistent with the broader literature that documents the role that firm self-commitments play in how information is processed (Swann, 1985), whether memory is distorted (Greenwald, 1980), and the extent to which beliefs persevere in the face of contradictory evidence (Lord, Ross, & Lepper, 1979). According to this reasoning, highly commited identity styles may be less amenable to potential disconfirmation of firmly held self-perceptions, preferring instead to adhere to previous personal convictions.

In conclusion, the overall results of this study provide some evidence concerning the relationship between ego identity style and the recall of autobiographical memory. The pattern of findings in this study were largely consistent with past work on the expected differences in processing self-relevant information among the three identity styles. However, some caution is

warranted in interpreting the results of this study. The cross-sectional nature of this study limits any interpretations regarding the developmental progression of personal memory recall.

Limitations of the Investigation

One limitation of the present investigation concerns the way in which subjects' self-theories were assessed. The only measure of the subjects' self-perceptions was the self-rating of how descriptive of themselves a particular personal characteristic was. Because most people initially tend to rate positive characteristics as rather highly self-descriptive and negative characteristics as only moderately self-descriptive, measures of changes in their self-theory were plagued by ceiling effects. Although the present investigation extended the level of the assessment of a person's self-theory compared to the level used in existing experimental memory research, a more thorough and specific assessment is needed. By using an assessment instrument that is less obvious and more personally meaningful (e.g., personally elicited constructs), subtle changes in subjects' self-theories could be ascertained. Also, by using characteristics that were more personally meaningful, subjects might be more able to explore the salient negative aspects of their personalities.

Recommendations for Future Research

The results of the present investigation justify the continued exploration of the role of identity style in the organization and retrieval of personally meaningful memories. Rather than conforming to the more traditional use of standardized memory cues found in past memory research, future investigations could rely more heavily on eliciting personally relevant memory cues through various techniques available in personal construct theory, which might lead to a better assessment of a person's self-theory. The use of a less obvious measure in order to derive a person's superordinate self-schemas could be accomplished using a repertory grid, a laddering procedure (Hinkle, 1965), or a variety of other ways to determine superordination (Metzler & Neimeyer, 1988). Such instruments could also yield some useful information about the overall positive or negative evaluative nature of the self-system and about the interrelationships among the self-schemata and possible changes in the organization of the self-theory.

The continued use of a computerized assessment to explore subjects' style of processing and assimilating self-relevant information could allow for more comprehensive understanding of the relationship between self-structure and autobiographical memory. In addition, analysis of the actual memories retrieved through computer elicitation could yield valuable data. For

example, if the time periods from which the retrieved memories came were recorded and analyzed, different identity styles might be found to differ in the average age of the memories retrieved.

APPENDIX A
IDEOLOGICAL IDENTITY SCALE

Read each item and indicate to what degree it reflects your own thoughts and feelings. If a statement has more than one part, please indicate your reaction to the item as a whole. Mark the number on the attached answer sheet that best reflects your opinion. Please be sure to respond to all 32 of the items. Do not write on this booklet.

1) I strongly disagree
2) I moderately disagree
3) I neither agree nor disagree
4) I moderately agree
5) I strongly agree

1. I haven't chosen the occupation I really want to get into, and I'm just working at whatever is available until something better comes along.

2. When it comes to religion, I just haven't found anything that appeals and I don't really feel the need to look.

3. There's no single "life style" which appeals to me more than another.

4. Politics is something that I never can be too sure about because things change so fast. But I do think it's important to know what I can politically stand for and believe in.

5. I'm still trying to decide how capable I am as a person and what jobs will be right for me.

6. I don't give religion much thought and it doesn't bother me one way or the other.

7. I'm looking for an acceptable perspective for my own "life style" view, but I haven't really found it yet.

8. I haven't really considered politics. It just doesn't excite me much.

9. I might have thought about a lot of different jobs, but there's never really any question since my parents said what they wanted.

10. A person's faith is unique to each individual. I've considered and reconsidered it myself and I know what I can believe.

11. After considerable thought I've developed my own individual viewpoint of what is for me an ideal "life

style" and I don't believe anyone will be likely to change my perspective.

12. I guess I'm pretty much like my folks when it comes to politics. I follow what they do in terms of voting and such.

13. I'm really not interested in finding the right job; any job will do. I just seem to flow with what is available.

14. I'm not sure what religion means to me. I'd like to make up my mind but I'm not done looking yet.

15. My own views on a desirable life style were taught to me by my parents and I don't see any need to question what they taught me.

16. There are so many different political parties and ideals. I can't decide which to follow until I figure it all out.

17. It took me a while to figure it out, but now I really know what I want for a career.

18. Religion is confusing for me right now. I keep changing my views on what is right and wrong for me.

19. In finding an acceptable viewpoint to life itself, I find myself engaging in a lot of discussions with others and some self-exploration.

20. I've thought my political beliefs through and realize I can agree with some and not other aspects of what my parents believe.

21. My parents decided a long time ago what I should go into for employment and I'm following through their plans.

22. I've gone through a period of serious questions about faith and can now say I understand what I believe in as an individual.

23. My parents' views on life are good enough for me, I don't need anything else.

24. I'm not sure about my political beliefs, but I'm trying to figure out what I can truly believe in.

25. It took me a long time to decide but now I know for sure what direction to move in for a career.

26. I attend the same church my family has always attended. I've never really questioned why.

27. I guess I just kind of enjoy life in general, and I don't see myself living by any particular viewpoint to life.

28. I really have never been involved in politics enough to have made a firm stand one way or the other.

29. I just can't decide what to do for an occupation. There are so many that have possibilities.

30. I've never really questioned my religion. If it's right for my parents it must be right for me.

31. After a lot of self-examination I have established a very definite view on what my own lifestyle will be.

32. My folks have always had their own political and moral beliefs about issues like abortion and mercy killing and I've always gone along accepting what they have.

APPENDIX B
ZUNG SELF-REPORT SCALE FOR DEPRESSION (ZSRS)

Please read the following statements and indicate whether they apply to you:

1) a little of the time, 2) some of the time, 3) a good part of the time,

or 4) most of the time.

1. I feel down-hearted and blue.
2. Morning is when I feel the best.
3. I have crying spells or feel like it.
4. I have trouble sleeping at night.
5. I eat as much as I used to.
6. I still enjoy sex.
7. I notice that I am losing weight.
8. I have trouble with constipation.
9. My heart beats faster than usual.
10. I get tired for no reason.
11. My mind is as clear as it used to be.
12. I find it easy to do the things I used to do.
13. I am restless and can't keep still.
14. I feel hopeful about the future.
15. I am more irritable than usual.
16. I find it easy to make decisions.

17. I feel that I am useful and needed.
18. My life is pretty full.
19. I feel that others would be better off if I were dead.
20. I still enjoy the things I used to.

APPENDIX C
EXAMPLE OF INTERACTION IN COMPUTER TASKS

As part of the procedure for the elicitation of autobiographical memories, the subject was asked to perform a number of tasks which were monitored by a computer program. During this portion of the experiment, subjects interacted directly with the program. The following description illustrates the procedure used.

The first task was a practice exercise. The prompt was like the six-point rating scale used in all subsequent rating tasks. In each step of this task, one of the numbered items was marked, and the subject was expected to press the corresponding number key. The following instructions were displayed at the top left of the computer screen:

> PLEASE PRACTICE SOME KEY PRESSES. PRESS THE (1-6) MARKED KEY. USE YOUR DOMINANT HAND.

After a moment, the message PRESS ANY KEY TO CONTINUE was displayed in the bottom right corner of the screen. When the subject had read the instructions and felt ready to continue, pressing any key caused the screen to clear and

the following display to be presented:

```
                X
******      .  .  .  .  .  .      ******
******      1  2  3  4  5  6      ******
```

The message PRESS KEY CORRESPONDING TO "X" appeared in the bottom right corner of the display. Pressing the "1" key changed the display to the following:

```
                X
******      .  .  .  .  .  .      ******
******      1  2  3  4  5  6      ******
```

The subject continued pressing the indicated key until all six items had been used. Then the message PRESS SPACE BAR TO CONTINUE appeared at the bottom of the screen, again indicating that the subject could continue as soon as he or she was ready. Next, the subjects received the following message to guarantee them of the importance to the experimenter of their privacy and anonymity:

> PLEASE ASSURE THAT THE EXPERIMENTER HAS LEFT THE ROOM WHILE YOU ARE DOING THE EXPERIMENTAL TASKS. YOUR PRIVACY AND ANONYMITY ARE VERY IMPORTANT.

As before, after a few moments the message PRESS SPACE BAR TO CONTINUE appeared, to allow the subject to proceed at his or her own pace. For the next task, the subjects rated the importance of 28 bipolar trait pairs. The directions to this schemata ordination rating task

were presented on the screen as follows:

> PERSONS FORM IMPRESSIONS OF OTHERS ACCORDING TO VARIOUS DIMENSIONS SUCH AS (AMBITIOUS-LAZY) OR (POLITE-IMPOLITE). PERSONS DIFFER AS TO HOW IMPORTANT THEY BELIEVE ANY PARTICULAR DIMENSION IS IN FORMING AN IMPRESSION OF ANOTHER. ONE DIMENSION AT A TIME WILL BE PRESENTED ON THE SCREEN. PLEASE RATE EACH DIMENSION ACCORDING TO HOW IMPORTANT YOU BELIEVE IT IS IN FORMING AN IMPRESSION OF A PERSON. THE RATING SCALE IS:
>
> NOT AT ALL . . . . . VERY
> IMPORTANT 1 2 3 4 5 6 IMPORTANT
>
> RATE ACCORDING TO YOUR OWN PRIVATE OPINION. YOU WILL PRESS A KEY FROM 1-6.

Once again, the reminder PRESS SPACE BAR TO CONTINUE appeared after a few moments. The experimenter read over the directions with the subject and gave examples of important, unimportant, and neutral dimensions to familiarize the subject with the task. Particular attention was paid to making sure the subject felt completely free to use the entire range represented by the scale. An example or two was discussed in terms of the how the experimenter might rate it, and then additional examples were discussed from the subject's viewpoint. The examples were taken from the set AMBITIOUS--LAZY, POLITE--IMPOLITE, WEALTHY--POOR, FORGIVING--UNFORGIVING, and CONFORMIST--NONCONFORMIST; these examples were carefully selected to ensure that no example could impact the subject's actual ratings. Prior to beginning the rating task, a final cautionary note was

presented by the program as follows:

YOU CANNOT CHANGE YOUR RATING ONCE MADE
DUE TO THE WORKINGS OF THE COMPUTER.

DO YOU HAVE ANY QUESTIONS?

The experimenter stood by and answered questions for the first dummy dimension. If the subject was still having problems understanding the task, the other two dummy dimensions were used to elicit questions. Responding to the PRESS SPACE BAR TO CONTINUE message led to the first dimension to be rated (which was a dummy dimension):

AMBITIOUS--LAZY

not at all . . . . . very
important 1 2 3 4 5 6 important

As soon as the subject pressed one of the number keys from 1 to 6, an "X" appeared over the selected rating to confirm the choice. The message PRESS SPACE BAR TO CONTINUE appeared as well. When the subject pressed the space bar, the "X" and the "continue" message disappeared, and the first dimension was replaced with a new one, as follows:

FORGIVING--UNFORGIVING

not at all . . . . . very
important 1 2 3 4 5 6 important

This second dimension was also a dummy. The subject selected a rating as before, and then pressed the space bar again to continue to the next dimension:

CONFORMIST--NONCONFORMIST

not at all . . . . . very
important 1 2 3 4 5 6 important

This third dimension was the last dummy dimension for this task. The subject then rated the 25 true dimensions in privacy. Each of the actual dimensions was presented in exactly the same way as the dummy dimensions. The true dimensions were presented in a random order. After the last dimension had been rated, responding to the PRESS THE SPACE BAR TO CONTINUE prompt caused the screen to be cleared and the following message to be displayed:

PLEASE GET THE EXPERIMENTER NOW. PLEASE DON'T PRESS ANY KEY. THE NEXT TASK WILL SOON APPEAR -- PLEASE WAIT.

After 10 seconds, this message was replaced with the instructions for the next rating task. For this task, the subjects rated 53 individual traits. The instructions were as follows:

NOW, PLEASE RATE EACH OF THE FOLLOWING TRAITS ACCORDING TO THE DEGREE THAT YOU PRIVATELY BELIEVE THAT THE TRAIT DESCRIBES YOU. THE RATING SCALE IS:

NOT ME . . . . . ME
------ 1 2 3 4 5 6 --

YOU WILL PRESS A KEY FROM 1-6. YOU CANNOT CHANGE YOUR RATING ONCE MADE DUE TO THE WORKINGS OF THE COMPUTER.

(Followed, as usual, by a PRESS SPACE BAR TO CONTINUE message.) The experimenter again gave examples of traits that might be like themselves, not like themselves, and somewhere in the middle. The examples were discussed to ensure that the subject was properly oriented to the new scale and understood what was expected. The examples used were taken from the set AMBITIOUS, LAZY, POLITE, IMPOLITE, WEALTHY, POOR, FORGIVING, UNFORGIVING, CONFORMIST, and NONCONFORMIST. The first of the three dummy traits then appeared:

LOGICAL

```
not me      . . . . . .      me
------      1 2 3 4 5 6      --
```

This new rating scale behaved exactly as the previous one. When the subject had selected a rating by pressing a number key, the selected rating was marked and the user was cued to continue. Pressing the space bar caused the program to display the next trait:

UNFORGIVING

```
not me      . . . . . .      me
------      1 2 3 4 5 6      --
```

As before, each trait was presented in turn. The third and final dummy trait was:

IMPOLITE

```
not me      . . . . . .      me
------      1 2 3 4 5 6      --
```

Again, when all questions were answered and the subject appeared to understand the task, the experimenter left the room. The 50 real traits were presented and the subject rated them, until the following message appeared:

> DO NOT PRESS ANY KEY AT THIS TIME.
> PLEASE GET THE EXPERIMENTER. THANK YOU.

After a pause, the message PRESS SPACE BAR TO CONTINUE was given. The experimenter pressed the space bar to bring up the first screenful of instructions for the next task:

> IN THIS PART OF THE EXPERIMENT, A TRAIT WILL BE PRESENTED ON THE SCREEN. YOUR TASK IS TO RECALL SPECIFIC INCIDENTS IN YOUR LIFE WHEN YOU DEMONSTRATED THE PARTICULAR TRAIT.

(Followed momentarily by a PRESS SPACE BAR TO CONTINUE message.) The experimenter explained that a trait such as AMBITIOUS would appear on the screen. The subject was requested to recall times when they demonstrated that trait. When the subject was ready, pressing the space bar led to the next part of the instructions:

> PLEASE PRESS THE "ENTER" KEY EACH TIME YOU RECALL A PARTICULAR INCIDENT WHEN YOU DEMONSTRATED THE TRAIT SHOWN. THEN QUICKLY JOT DOWN A WORD OR PHRASE TO HELP YOU REMEMBER THE INCIDENT. WHAT YOU CHOOSE TO WRITE IS NOT IMPORTANT -- AS LONG AS IT HELPS YOU RECALL THE INCIDENT.

The experimenter asked the subject to recall an incident for an example trait, such as AMBITIOUS. When

they had recalled a specific memory, the experimenter pointed to the ENTER key, which was labelled PRESS HERE FOR EACH MEMORY, and instructed them to press this key each time they remembered an incident. The subject was then given 4 pieces of paper and told to write a word or short phrase for each memory recalled.

The experimenter then asked them to think of another memory relating to AMBITIOUS, and indicated that they should continue pressing the ENTER key and jotting down short phrases for as many memories as they could recall until the computer told them to stop. The experimenter cautioned them to only make a short note of the memory--just enough for them to be able to recall the incident later. After the subject pressed the space bar to continue, the program presented some guidelines for the recall process:

> PLEASE NOTE THE
> FOLLOWING GUIDELINES:
>
> 1. THE INCIDENT MAY HAVE OCCURRED QUITE RECENTLY OR MANY YEARS AGO.
>
> 2. YOU MUST BE ABLE TO RECALL SOMETHING THAT MAKES THE INCIDENT A DISTINCT MEMORY. IF THE SAME TYPE OF INCIDENT HAPPENED MORE THAN ONCE, PRESS THE KEY FOR EACH INCIDENT ONLY IF YOU CAN RECALL SOMETHING THAT MAKES YOU CERTAIN THAT THE OTHER INCIDENT HAPPENED ON A DIFFERENT OCCASION.

The experimenter read over these first two guidelines with the subject. Examples of recent, past,

and distant past incidents relating to AMBITION were given as an example. Because the event could vary in significance, the experimenter gave examples of insignificant events (e.g., studying for a test that morning), and significant events (e.g., applying for graduate school). When the subject appeared to understand, pressing the space bar caused the following additional guidelines to appear:

3. IT DOESN'T MATTER IF ANYONE ELSE WOULD AGREE WITH YOU AS TO WHETHER THE INCIDENT "COUNTS". YOUR OPINION IS ALL THAT MATTERS.

4. PRESS THE "ENTER" KEY AS SOON AS YOU RECALL AN INCIDENT, BUT NOT BEFORE.

5. IT IS IMPORTANT THAT YOU KEEP TRYING TO RECALL INCIDENTS DURING THE ALLOTTED TIME. A TOTAL OF FOUR TRAITS WILL BE PRESENTED. YOU WILL HAVE ONE AND A HALF MINUTES PER TRAIT AND A FIFTEEN-SECOND REST PERIOD BETWEEN TRAITS. YOU WILL KNOW WHEN THE TIME IS UP FOR EACH TRAIT, BECAUSE A "STOP" MESSAGE WILL APPEAR ON THE SCREEN.

Again, the experimenter read over these new guidelines with the subject and stressed the importance of trying to continue recalling memories for the full minute and a half. The computer would let them know when the time was up. The subject was told to expect a total of four cue words. The subject was given a printed copy of the instructions for this task, including the guidelines for memories (the wording of these instructions exactly matched what was displayed on the

preceding four screens). When the subject was ready, the experimenter left the room. As soon as the subject pressed the space bar, the screen cleared and the first cue was presented. For example:

OUTGOING

The cue remained on-screen for 90 seconds. At the end of this time, the screen cleared, a beep was sounded, and the following message appeared:

*** PLEASE STOP NOW ***

After 15 seconds, the screen cleared, and the next cue was presented. This process continued for all four cues. The program ended this phase of the experiment with the message:

> PLEASE TELL THE EXPERIMENTER THAT YOU HAVE COMPLETED THE MEMORY TASKS.

(Followed by a PRESS SPACE BAR TO CONTINUE message.) The experimenter returned and asked the subject to re-examine the list of phrases that represented incidents recalled. For each, the subject was asked to supply an approximate date when the incident occurred. The subject was then told that the final computer task was to re-rate the traits that had been rated before. The instructions were as follows:

> NOW, PLEASE RE-RATE EACH OF THE FOLLOWING TRAITS ACCORDING TO THE DEGREE THAT YOU PRIVATELY BELIEVE THAT THE TRAIT DESCRIBES YOU. THE RATING SCALE IS:

NOT ME . . . . . ME
------ 1 2 3 4 5 6 --

YOU WILL AGAIN PRESS A KEY FROM 1-6.
REMEMBER, YOU CANNOT CHANGE YOUR RATING
ONCE MADE DUE TO THE WORKINGS OF THE
COMPUTER.

(Followed by a PRESS SPACE BAR TO CONTINUE message.) The experimenter asked the subject to re-rate the traits according to how they felt about it at that moment. They were advised that they need not try to remember how they had rated the traits previously, as this was not a test of their memory. This task proceeded as before, starting with the same three dummy traits:

LOGICAL

not me . . . . . me
------ 1 2 3 4 5 6 --

(The actual traits, however, were not presented in the same order in which they had originally been seen.) After repeating all 53 traits, the program displayed the following message to end the administration of the computer tasks:

DO NOT PRESS ANY KEY AT THIS TIME.
PLEASE GET THE EXPERIMENTER. THANK YOU.

APPENDIX D
EXPERIMENTAL MATERIALS

The fifty traits presented during the rating tasks were taken from the bipolar trait pairs used as schemata by Landy (1986/1987). Landy derived the terms in her list from Anderson's (1968) list of personality trait adjectives. Anderson established normative ratings of likeability and meaningfulness for each of the trait terms, and Landy used these ratings to select pairs of opposing traits such that the terms in each pair were both highly meaningful and divided between a strongly positive and a strongly negative trait.

Anderson (1968) constructed his list for use in studies of information integration in personality impression tasks. Beginning with a list of 18,000 traits compiled by Allport and Odbert (1936), Anderson reduced the list to 555 trait adjectives. Based on ratings data from 100 male and female college students, Anderson established that the terms in the list were free of gender bias and classified them according to the relative meaningfulness of each trait as a personality descriptor and the perceived desireability of possessing that trait. Later researchers have further elaborated Anderson's

norms, and his list is widely employed in research in social and personality psychology.

Landy (1986/1987) used Anderson's ratings to construct pairs of traits so that both members of each pair were highly meaningful. (See Table 8.) The meaningfulness of the traits selected ranged from 3.58 to 3.86 on a scale of 0.00 to 4.00, where higher numbers indicate greater meaningfulness. Traits whose opposite rated low in meaningfulness were excluded from consideration, as were traits whose opposite seemed indistinct or difficult to characterize in a single word. Within each trait pair, the trait rated highest on likeability was regarded as the positive pole of that schema. A clear separation of the traits was achieved by this criterion, with the positive traits having likeability scores ranging from 3.73 to 5.45, while negative traits ranged from 0.43 to 2.91 (higher scores represent greater desirability).

Table 8. Likeability and Meaningfulness Ratings of Personal Characteristics

Positive Trait	L	M	Negative Trait	L	M
TRUTHFUL	5.45	3.84	UNTRUTHFUL	0.43	3.80
RELIABLE	5.27	3.74	UNRELIABLE	1.04	3.86
FRIENDLY	5.19	3.80	UNFRIENDLY	0.92	3.86
COMPETENT	4.47	3.74	INCOMPETENT	1.10	3.64
GENTLE	5.03	3.68	FORCEFUL	2.63	3.58
COOPERATIVE	4.76	3.80	STUBBORN	1.96	3.80
THOUGHTFUL	5.29	3.76	THOUGHTLESS	0.77	3.66
SKILLED	4.33	3.62	UNSKILLED	2.24	3.60
OUTGOING	4.12	3.64	SHY	2.91	3.76
INTELLIGENT	5.37	3.68	UNINTELLIGENT	1.68	3.64
PUNCTUAL	4.66	3.82	UNPUNCTUAL	1.92	3.66
TIDY	4.27	3.82	UNTIDY	1.75	3.86
POPULAR	4.97	3.68	UNPOPULAR	2.22	3.62
OBEDIENT	3.73	3.80	DISOBEDIENT	1.28	3.78
DECISIVE	4.27	3.60	INDECISIVE	2.19	3.76
ATTRACTIVE	*	*	UNATTRACTIVE	*	*
GENEROUS	4.59	3.70	SELFISH	0.82	3.84
KIND	5.20	3.68	HOSTILE	0.91	3.72
BROADMINDED	5.03	3.64	NARROWMINDED	0.80	3.74

Table 8--continued.

Positive Trait	L	M	Negative Trait	L	M
INDEPENDENT	4.55	3.74	DEPENDENT	2.54	3.60
COURAGEOUS	4.71	3.66	COWARDLY	1.10	3.74
MODEST	4.28	3.74	BOASTFUL	1.22	3.80
TOLERANT	4.61	3.72	INTOLERANT	0.98	3.62
TRUSTWORTHY	5.39	3.70	UNTRUSTWORTHY	0.65	3.76
THRIFTY	*	*	WASTEFUL	*	*

Note: The column labelled L refers to the likeability rating of the trait adjective. The higher the rating, the more favorable or desirable the trait as a description of a person. The column labelled M refers to the meaningfulness rating of the trait adjective. The higher the rating, the more meaningful the trait in describing a person (Anderson, 1968). The trait pairs "ATTRACTIVE/UNATTRACTIVE" and "THRIFTY/WASTEFUL" were not in Anderson's (1968) list.

APPENDIX E
PROGRAM OPERATION AND SELECTION OF CUES

A microcomputer program, RATIMER (Reese & Metzler, 1990), was used to monitor the memory retrieval task and the ancillary rating tasks. Subjects interacted directly with the program, which controlled the selection of cues for the recall task and recorded the Retrieval Quantity and Retrieval Latency of subjects' responses. This technique was adapted from Landy's (1986/1987) computer program, which automated a cued-response paradigm originating with Crovitz and Schiffman (1974).

Summary of Operation

The experimenter initiated each run of the program, providing it with the subject's identification number and a code which indicated the subject's experimental condition. Following this, the program displayed the first page of instructions for the first task on the computer's screen, and the interaction with the subject began. The program proceeded through the rating and retrieval tasks at the subject's own pace (as described in Appendix C), displaying appropriate instructions and messages at each stage. The program randomized the

presentation order of the constructs and traits and recorded the subject's ratings on all items. Based on these ratings and the subject's experimental condition, the program determined the traits to be presented as retrieval cues in the memory retrieval task (this process is described in greater detail below). The program controlled the timing of this task, assuring that each cue was presented for 90 seconds and that the interval between cues was 15 seconds. The program also recorded the number of responses to each cue (Retrieval Quantity) and the delay in responding (Retrieval Latency). All data were recorded in a file on disk for later processing.

Selection of Retrieval Cues

The selection process within the program was governed by the subject's experimental condition and responses to the two rating tasks. In all cases, a subject received cues from constructs that had been rated as personally important by that subject. The experimental condition determined whether the traits to be presented were to be taken from the positive or negative poles of these constructs (schemata valence) and whether they were to have been rated as self-similar or self-dissimilar (schemata validation).

For example, suppose the experimental condition of the subject indicated that the subject should be asked to

recall memories that validated the positive aspects of his or her self-theory. In this case, the goal of the selection process was to locate cue words that were superordinate (i.e., rated highly on the scale "not at all important 1 2 3 4 5 6 very important"), positive (i.e., one of the favorable traits, such as "truthful", rather than one of the unfavorable traits, such as "cowardly"), and self-similar (i.e., rated highly on the scale "not me 1 2 3 4 5 6 me").

For a subject in this experimental condition, the selection process operated as follows. First, the construct or set of constructs with the highest rating on the "not at all important 1 2 3 4 5 6 very important" scale was examined. (Because there were only six rating points and 25 constructs to be rated, it was very likely that several constructs would share this "highest" ordination rating.) Based on the experimental condition of this subject, only the positive pole of each of these constructs was considered. The rating of each positive trait in this set on the scale "not me 1 2 3 4 5 6 me" was then checked. Because the goal of the selection process for this subject was to find self-similar traits, the highest-rated trait on this scale was selected first. If there were several traits with the same "highest" rating on this scale as well, then each had an equal chance of being selected first. Then the trait within this set rated next most highly on self-similarity was

selected, and so on. Once four cues had been selected, the selection process stopped. If the set of constructs rated most highly on ordination contained fewer than four constructs, the process was repeated with the set of constructs with the next lower ordination rating, until four cues had been selected.

The selection process operated in a similar fashion for the other experimental conditions. For those conditions where subjects were expected to recall memories that either validated or invalidated negative aspects of their self-theories, it was the negative pole of the superordinate constructs that was used, rather than the positive pole. Therefore, in these cases, it was the self-similarity rating of the negative trait which resolved ties between equally-important constructs. Likewise, for those conditions where subjects were to receive cues that invalidated their self-theories, traits with the lowest self-similarity ratings were selected first, rather than traits with the highest self-similarity ratings. In all other respects, the procedure was identical.

The gist of this process, then, is that four traits were selected (either all positive or all negative) that were regarded by the subject as personally important and that either all confirmed (self-descriptive traits) or all disconfirmed (non-self-descriptive traits) the subject's self-perceptions.

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April Elizabeth Metzler was born on April 9, 1959, in Sumter, South Carolina. In 1977, she graduated from Northeast Senior High School in St. Petersburg, Florida. She received her Bachelor of Arts degree in psychology in 1985 from the University of Florida in Gainesville, Florida. She received her Master of Science degree in counseling psychology from the University of Florida in 1987.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Greg J. Neimeyer, Chair
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Franz Epting
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of the Department of Psychology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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